

CLEARING & GRADING DEVELOPMENT STANDARDS

July 14, 2017



Issued by

**CITY OF BELLEVUE
DEVELOPMENT SERVICES DEPARTMENT**

A handwritten signature in black ink, which appears to read "Michael Brennan". The signature is written in a cursive style and is positioned above a horizontal line.

Michael Brennan
Director

Table of Contents

- CHAPTER CG1 – GENERAL REQUIREMENTS.....8**
- CG1 – 01 PURPOSE8
- CG1 – 02 CODE AUTHORITY8
- CG1 – 03 RESPONSIBILITY FOR IMPLEMENTING STANDARDS.....8
- CG1 - 04 DEFINITIONS.....9
- CG1 – 05 ABBREVIATIONS AND ACRONYMS 13
- CHAPTER CG2 – PERMIT REQUIREMENTS 16**
- CG2 – 01 GENERAL 16
- CG2 – 02 CLEARING AND TREE REMOVAL..... 16
- CG2-02.1 Clearing..... 16*
- CG2-02.2 Tree Removal 17*
- CG2 – 03 GRADING..... 18**
- CG2 – 04 HARD SURFACE..... 18**
- CG2 – 05 ROCKERIES AND MODULAR BLOCK WALLS..... 18**
- CG2 – 06 CRITICAL AREAS..... 18**
- CG2 – 07 EXEMPTIONS 20**
- CHAPTER CG3 - PERMIT APPLICATION SUBMITTAL 21**
- CG3 – 01 GENERAL 21
- CG3 – 01.1 Permit Types..... 21*
- CG3 - 01.2 Submittal Requirements..... 21*
- CG3 – 01.3 Completeness..... 22*
- CG3 – 01.4 Request for Deviation from Clearing & Grading Development Standards 22*
- CG3 – 02 PLANS & DRAWINGS 23
- CG3–02.1 General..... 23*
- CG3 – 02.2 Combining Plans..... 23*
- CG3 – 03 WRITTEN REPORTS AND PLANS 23
- CG3 - 03.1 Construction Stormwater Pollution Prevention Plan (CSWPPP)..... 23*
- GC3 – 03.2 Geotechnical Report..... 24*

<i>CG3- 03.3</i>	<i>Turbidity & pH Monitoring Plan</i>	<i>25</i>
<i>CG3- 04.1</i>	<i>Application Forms.....</i>	<i>25</i>
<i>CG3- 04.2</i>	<i>Rights of Entry and Construction Easements.....</i>	<i>25</i>
<i>CG3- 04.3</i>	<i>Abatement Security</i>	<i>26</i>
<i>CG3 – 05</i>	<i>PROFESSIONAL QUALIFICATIONS</i>	<i>26</i>
<i>CG3- 05.1</i>	<i>Engineering.....</i>	<i>26</i>
<i>CG3-05.2</i>	<i>Landscape Design</i>	<i>27</i>
<i>CG3-05.3</i>	<i>Certified Erosion and Sediment Control Lead (CESCL).....</i>	<i>27</i>
<i>CG3-05.4</i>	<i>Arborist.....</i>	<i>27</i>
<i>CG3-05.5</i>	<i>Other Professionals.....</i>	<i>27</i>
	CHAPTER CG4 – PERMIT ISSUANCE.....	28
<i>CG4 – 01</i>	ASSOCIATED PERMITS AND APPROVALS	28
<i>CG4-01.1</i>	<i>Land Use Approvals.....</i>	<i>28</i>
<i>CG4-01.2</i>	<i>Construction Permits</i>	<i>28</i>
<i>CG4-01.3</i>	<i>Permits from other jurisdictions</i>	<i>29</i>
<i>CG4 - 02</i>	VESTING AND EXPIRATION OF PERMITS AND APPLICATIONS	29
<i>CG4-02.1</i>	<i>Projects Requiring Only Clearing and Grading Permits.....</i>	<i>29</i>
<i>CG4-02.2</i>	<i>Projects Requiring Prior Discretionary Land Use Permit or Approval</i>	<i>30</i>
<i>CG4-02.3</i>	<i>Projects Requiring Building Permits and No Prior Discretionary Land Use Permit or Approval</i>	<i>31</i>
	CHAPTER CG5 – STANDARDS FOR CLEARING & GRADING	32
<i>CG5 – 01</i>	GENERAL	32
<i>CG5 – 02</i>	PRESERVING NATURAL VEGETATION.....	32
<i>CG5 – 03</i>	CLEARING AND GRADING AROUND TREES TO BE PRESERVED	32
<i>CG5 – 04</i>	PROTECTION OF SOILS FOR ON-SITE STORMWATER MANAGEMENT	33
<i>CG5 – 05</i>	CLEARING AND GRADING FOR PLATS AND SHORT PLATS	33
<i>CG5 – 06</i>	GRADING ADJACENT TO SENSITIVE AND CRITICAL AREAS.....	33
<i>CG5 - 07</i>	GRADING AROUND STRUCTURES	33
<i>CG5 – 08</i>	EXCAVATION AND FILLING.....	33

CG5 – 09	ENGINEERED FILL AND REINFORCED FILL	34
CG5 – 10	SOIL AMENDMENTS	34
CG5 – 11	ROCKERIES AND MODULAR BLOCK WALLS.....	34
CG5-11.1	<i>General</i>	34
GC 5-11.2	<i>Rockeries</i>	34
CG5-11.3	<i>Modular Block Walls</i>	36
CG5 – 12	WALL DRAINS	36
CG5 – 13	TEMPORARY SHORING.....	36
CG5 – 14	BLASTING	37
CG5 – 15	BULKHEADS.....	37
CG5 – 16	IN-WATER WORK	37
CG5 – 17	DRAINS	37
CG-17.1	<i>Surface-water and Downspout Drains</i>	38
CG5-17.2	<i>Subsurface Drains</i>	38
CG5 – 18	UNDERGROUND UTILITY LINES	38
CG5 – 19	RESTRICTIONS ON CLEARING AND GRADING	39
CG5-19.1	<i>Temporary Restrictions</i>	39
CG5-19.2	<i>Noise Restrictions</i>	39
CG5 – 20	INTERRUPTION, SUSPENSION, OR ABANDONMENT OF WORK	40
CG5 – 21	POST-CONSTRUCTION SOILS.....	40
CHAPTER CG6 – SLOPES.....		41
CG6 – 01	GENERAL	41
CG6 - 02	TOPOGRAPHY.....	41
CG6 – 03	GEOTECHNICAL REQUIREMENTS	41
CG6 – 04	FOUNDATION CLEARANCES FROM SLOPES	42
CG6 – 05	SLOPE DRAINAGE	42
CHAPTER CG7 - CONSTRUCTION STORMWATER POLLUTION PREVENTION		43
CG7 – 01	GENERAL	43
CG7 – 02	PLANNING	43

CG7 – 03	STANDARDS AND SPECIFICATIONS FOR BEST MANAGEMENT PRACTICES	43
CHAPTER CG8 – INSPECTION		44
CG8 – 01	INSPECTION BY THE PERMITTEE	44
CG8 – 01.1	Recordkeeping and Reporting	44
CG8 – 02	INSPECTION BY THE CITY.....	44
CG8 – 03	FINAL APPROVAL.....	45
CHAPTER CG9 – VIOLATIONS.....		46
CG9 – 01	GENERAL	46
CG9 – 02	ENFORCEMENT PROCESS.....	46
APPENDIX A		47
CONSTRUCTION STORMWATER POLLUTION PREVENTION PLANNING		47
<i>A. 1 General Guidelines</i>		<i>47</i>
<i>A.2 CSWPPP Requirements</i>		<i>50</i>
<i>A. 3 Step-By-Step Procedure.....</i>		<i>52</i>
Construction Stormwater Pollution Prevention Plan Checklist.....		69
Construction Stormwater Pollution Prevention Plan Checklist.....		70
Construction Stormwater Pollution Prevention Plan Checklist.....		71
Construction Stormwater Pollution Prevention Plan Checklist.....		72
Construction Stormwater Pollution Prevention Plan Checklist		73
APPENDIX B		74
BEST MANAGEMENT PRACTICES		74
B.1 Source Control BMPs		74
BMP-C101: Preserving Natural Vegetation.....		76
BMP-C102: Buffer Zones.....		76
BMP-C103: High Visibility Fence		76
BMP-C105: Stabilized Construction Entrance/Exit		76
BMP-C106: Wheel Wash.....		76
BMP-C107: Construction Road/Parking Area Stabilization.....		76
BMP-C120: Temporary and Permanent Seeding.....		76

BMP-C121: Mulching	76
BMP-C122: Nets and Blankets	76
BMP-C123: Plastic Covering.....	76
BMP-C124: Sodding	76
BMP-C125: Topsoiling / Composting	76
BMP-C126: Polyacrylamide (PAM) for Soil Erosion Protection	76
BMP-C130: Surface Roughening	76
BMP-C131: Gradient Terraces	76
BMP-C140: Dust Control	76
BMP-C150: Materials on Hand.....	76
BMP-C151: Concrete Handling	76
BMP-C152: Sawcutting and Surfacing Pollution Prevention.....	76
BMP-C153: Material Delivery, Storage and Containment	76
BMP-C154: Concrete Washout Area.....	76
BMP-C160: Certified Erosion and Sediment Control Lead.....	76
BMP-C162: Scheduling.....	76
B.2 Runoff Conveyance and Treatment BMPs.....	77
BMP-C200: Interceptor Dike and Swale.....	79
BMP-C201: pH Control for High pH Water	79
BMP-C202: Channel Lining.....	79
BMP-C203: Water Bars	79
BMP-C204: Pipe Slope Drains	79
BMP-C205: Subsurface Drains	79
BMP-C206: Level Spreader	79
BMP-C207: Check Dams.....	79
BMP-C208: Triangular Silt Dike (TSD) (Geotextile-Encased Check Dam).....	79
BMP-C209: Outlet Protection	79
BMP-C220: Storm Drain Inlet Protection.....	79

BMP-C231: Brush Barrier	79
BMP-C232: Gravel Filter Berm	79
BMP-C233: Silt Fence	79
BMP-C234: Vegetated Strip	79
BMP-C235: Wattles.....	79
BMP-C236: Vegetative Filtration	79
BMP-C240: Sediment Trap.....	79
BMP-C241: Temporary Sediment Pond	79
BMP-C250: Construction Stormwater Chemical Treatment.....	79
BMP-C251: Construction Stormwater Filtration.....	79
BMP-C252: High pH Neutralization Using CO2	79
BMP-C253: pH Control for High pH Water	79
APPENDIX C	80
CONSTRUCTION STORMWATER POLLUTION PREVENTION ADDITIONAL STANDARDS AND SPECIFICATIONS FOR LOCAL REGULATIONS AND PRACTICES	80
CONSTRUCTION EMERGENCY CONTACT SHEET	94
City of Bellevue Inspectors.....	95
CONSTRUCTION EMERGENCY CONTACT SHEET	96
CSWPPP.....	98
Standard Notes for Erosion Control Plans.....	112
Background Information on Chemical Treatment	114

CHAPTER CG1 – GENERAL REQUIREMENTS

CG1 – 01 PURPOSE

The purpose of the Clearing and Grading Standards is to provide the minimum design and construction standards for land alteration, clearing, grading, and erosion control work. The clearing and grading code (Chapter 23.76 of the Bellevue City Code (BCC)), and the city's National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge General Permit for Discharges from Small Municipal Separate Storm Sewers in Western Washington provide the authority for and are the basis for these development standards.

Although these standards are intended to apply to land disturbing activities, not all the standards will apply in all situations. Compliance with these standards does not relieve the professional civil engineer or contractor from the responsibility of applying conservative and sound professional judgment. These are minimum standards and are intended to assist, but not substitute for, competent work by engineers and contractors. The Development Services Department (DSD) may, at its sole discretion, due to special conditions and/or environmental constraints, require more stringent requirements than would normally be required under these standards.

CG1 – 02 CODE AUTHORITY

The standards imposed by this document are under authority of the City of Bellevue clearing & grading code (Bellevue City Code Chapter 23.76); the City of Bellevue land use code (Bellevue City Code Chapter 20); the Bellevue utilities code (Bellevue City Code Chapter 24); and/or the City of Bellevue civil violations code (Bellevue City Code Chapter 1.18).

CG1 – 03 RESPONSIBILITY FOR IMPLEMENTING STANDARDS

The clearing & grading permit holder (permittee) is responsible for implementing these standards. Project engineering and design must conform to the City of Bellevue codes and standards, including the clearing & grading code and these development standards. Compliance with codes and standards does not relieve the designer of the responsibility to apply sound professional judgment to protect the health, safety, and welfare of the general public.

Site conditions and environmental constraints may require a greater level of protection than would normally be required by city codes and standards. Design elements of any proposed project may have to be revised to comply with the requirements of these standards, or any other City of Bellevue permit conditions, codes and regulations.

CG1 - 04 DEFINITIONS

The following terms as used in this document shall be defined and interpreted as follows:

Applicant: the individual, partnership, association, or corporation applying for a permit to do work under the clearing and grading code, including the property owner, and any employee, agent, consultant or contractor acting on behalf of the applicant, and any successor in interest.

Best management practices (BMPs): the schedules of activities, prohibitions of practices, maintenance procedures, and structural and/or managerial practices that, when used singly or in combination, prevent or reduce the release of pollutants and other adverse impacts to the city's storm and surface water system or receiving waters.

Building site: shall have the meaning set forth in Chapter 20.50 LUC, now or as hereafter amended.

Clearing: the act of destroying or removing the existing soil cover (both vegetative and non- vegetative).

Clearing and Grading Permit: the written permission of the director to the permittee to proceed with the act of clearing and grading within the provisions of the clearing and grading code. The clearing and grading permit includes the associated approved plans and any conditions of approval as well as the permit form itself.

Code: unless noted otherwise, "code" refers to the clearing and grading code.

Construction stormwater pollution prevention plan (CSWPPP): a written plan to implement measures to identify, prevent, and control the contamination of point source discharge of stormwater. The CSWPPP explains and illustrates the measures, usually in the form of best management practices (BMPs), to take on a construction site to control potential pollution problems.

Critical Area: shall have the meaning set forth in Chapter 20.25 LUC, now or as hereafter amended.

Director: The director of the development services department or his/her designee or other person designated by the City Manager.

Ecology: the Washington State Department of Ecology.

Ecology Manual: the 2012 Stormwater Management Manual for Western Washington, as amended in December 2014.

Engineered fill: Soil fill which is wetted or dried to near its optimum moisture content, placed in lifts of 12 inches or less and each lift compacted to a minimum percent compaction as specified by a geotechnical engineer.

Excavation: the removal of material such as earth, soil, sand, peat, gravel, rock, asphalt, or concrete

Fill: earth, soil, sand, peat, gravel, rock, asphalt, concrete or other solid material used above or below the ordinary-high water mark to increase the ground surface elevation or to replace excavated material.

Filling: any act by which fill is deposited or placed.

Geotechnical Engineer: a Professional Engineer currently registered in the State of Washington, qualified by reason of experience and education in the practice of geotechnical engineering, and designated by the owner as the geotechnical engineer of record for the project.

Grading: any excavating or filling or combination thereof.

Ground water: water in a saturated zone or stratum beneath the surface of the land or below a surface water body.

Hard Surface: an impervious surface, a permeable pavement, or a vegetated roof.

Heavy rain: rainfall at a rate greater than or equal to 0.03 inches per 6 minutes or 0.30 inches per hour

Illicit discharge: Any direct or indirect non-storm water discharge to the storm and surface water system, except as expressly allowed by the storm and surface water utility code (BCC 24.06).

Impervious surface: A non-vegetated surface area that either prevents or retards the entry of water into the soil mantle as under natural conditions prior to development. It is also a non- vegetated surface area which causes water to run off the surface in greater quantities or at an increased rate of flow from the flow present under natural conditions prior to development.

Common impervious surfaces include, but are not limited to, roof tops, walkways, patios, driveways, parking lots or storage areas, concrete or asphalt paving, gravel roads, packed earthen materials, and oiled, macadam or other surfaces which similarly impede the natural infiltration of stormwater. Open, uncovered retention/detention facilities shall not be considered as impervious surfaces for purposes of determining whether the thresholds for application of minimum requirements are exceeded. Open, uncovered retention/detention facilities shall be considered impervious surfaces for purposes of runoff modeling.

Land disturbing activity: Any activity that results in a change in the existing soil cover (both vegetative and non-vegetative) and/or the existing soil topography. Land disturbing activities include, but are not limited to clearing, grading, filling, and excavation. Compaction that is associated with stabilization of structures and road construction shall also be considered a land disturbing activity. Vegetation maintenance practices are not considered land-disturbing activity.

Landscaping or landscaped areas: land that has been modified by altering soil levels and/or vegetation for aesthetic or practical purposes.

Landslide: the movement of a mass of rocks and/or earth down a slope.

Landslide deposit: a large mass of earth and/or rock that has moved physically downslope by gravity and broken into discrete fragments.

LID: Low Impact Development

LID BMP: Low impact development best management practices.

Live crown: The crown of a tree containing live foliage

Low Impact Development: A stormwater and land use management strategy that strives to mimic pre-disturbance hydrologic processes of infiltration, filtration, storage, evaporation and transpiration by emphasizing conservation, use of on-site natural features, site planning, and distributed stormwater management practices that are integrated into a project design.

Low impact development best management practices: Distributed stormwater management practices, integrated into a project design, that emphasize pre-disturbance hydrologic processes of infiltration, filtration, storage, evaporation and transpiration. LID BMPs include, but are not limited to, bio retention/rain gardens, permeable pavements, roof downspout controls, dispersion, soil quality and depth, vegetated roofs, minimum excavation foundations, and water re-use.

Minimum Requirements (MRs): the regulation contained in BCC 23.76.090 and BCC 24.06.065, now or as hereafter amended, and applicable development and engineering standards, which describe requirements for storm water management for development and redevelopment as required by the NPDES Permit.

Modular block wall: a wall constructed of manufactured modular wall units acting as a protective facing for an exposed soil face or as a gravity retaining wall.

New development: Land disturbing activities, including Class IV – General Forest Practices that are conversions from timber land to other uses; structural development, including construction or installation of a building or other structure; creation of hard surfaces; and subdivision, short subdivision and binding site plans, as defined and applied in Chapter 58.17 RCW, now or as hereafter amended. Projects meeting the definition of redevelopment shall not be considered new development.

NPDES: National Pollutant Discharge Elimination System.

NPDES permit: an authorization, license, or equivalent control document issued by either the United States Environmental Protection Agency or authorized state authority, which in Washington is the Department of Ecology, to authorize point source discharges to surface water and implement the provisions of 33 U.S.C. 1342 (Section 402) of the federal Clean Water Act.

Permanent erosion control: permanent improvements, such as landscaping or drainage control structures that cover the soil such that erosion is minimized or eliminated.

Permeable pavement: Pervious concrete, porous asphalt, permeable pavers or other forms of pervious or porous paving material intended to allow passage of water through the pavement section. It often includes an aggregate base that provides structural support and acts as a stormwater reservoir.

Permit: unless noted otherwise, refers to the clearing and grading permit - see clearing and grading permit.

Permittee: the property owner to whom the clearing and grading permit is issued. The property owner may be a person(s), partnership, association, or corporation. Both the property owner and its agent are considered the permittee and are responsible for ensuring compliance with this chapter.

Potential slide block (failure envelope): the area near the surface of a slope between the toe of the slope and a line extended upward at two feet horizontal to one foot vertical from the toe to the surface of the ground above the slope, or as otherwise determined by a geotechnical engineer.

Rain Garden: a non-engineered shallow landscaped depression, with compost-amended native soils and adapted plants. The depression is designed to pond and temporarily store stormwater runoff from adjacent areas, and to allow stormwater to pass through the amended soil profile.

Rainy season: that period from October 1 through April 30 unless the director modifies these dates based on weather patterns and forecasts.

Receiving waters: Naturally and/or reconstructed naturally occurring surface water bodies, such as creeks, streams, rivers, lakes, wetlands, estuaries, and marine waters or ground water to which a municipal separate storm sewer system (MS4) discharges.

Redevelopment: On a site that is already substantially developed, (i.e. has 35% or more of existing hard surface coverage), the creation or addition of hard surfaces; the expansion of a building footprint or addition or replacement of a structure; structural development including construction, installation or expansion of a building or other structure; replacement of hard surface that is not part of a routine maintenance activity; and land disturbing practices.

Reinforced fill or reinforced soil: soil fill, designed by an engineer that includes reinforcement consisting of metal or synthetic materials in bars, strips, grids or sheets.

Replaced impervious surfaces: For structures, the removal and replacement of any exterior impervious surfaces or foundation. For other impervious surfaces, the removal down to bare soil or base course and replacement

Responsible person(s): one, multiple, or all the following person(s) (if applicable): Property owners, agents, contractors, operators, developers, applicants, occupants of property, or any person(s) causing or contributing to a violation of the provision of the clearing and grading code, these standards or related manuals

Retaining wall: a wall designed to resist the lateral displacement of soil or other materials.

Rockery or rock wall: one or more courses of rocks stacked against an exposed soil face to protect the soil face from erosion and sloughing. The bottom course of rocks bears on the foundation soils and the upper rocks bear partially or entirely on the rocks below. The face inclination of a rockery varies from near vertical to about 1H:4V. A rockery or rock wall is not considered a retaining wall.

Runoff: Water that travels across the land surface and discharges to water bodies either directly or through a collection and conveyance system. See also "stormwater."

Significant tree: shall have the meaning set forth in Chapter 20.50 LUC, now or as hereafter amended.

Site: shall have the meaning set forth in Chapter 20.50 LUC, now or as hereafter amended

Slide or Landslide: the movement of a mass of loosened rocks and/or earth down a slope.

Soil: unaggregated or uncemented deposits of mineral and/or organic particles or fragments derived from the breakdown of massive rocks or decay of living matter.

Soil Cover: vegetative or non-vegetative material that is covering soil and which provides a barrier against erosion. Vegetative soil cover includes vegetation such as grass, weeds, groundcover, brush,

shrubs, and the canopy of trees. Non-vegetative soil cover includes material such as rocks, mulch (wood, bark, rock, stone, etc.), wood, asphalt or cement concrete, metal, plastic, lumber, paper, and trash.

Storm and Surface Water System: the entire system within the city, both public and private, naturally existing and manmade, for the drainage, conveyance, detention, treatment or storage of storm and surface waters. Facilities directly associated with buildings or structures such as foundation drains, rockery/retaining wall drains, gutters and downspouts or groundwater are not considered parts of the Storm and Surface Water System.

Stormwater: runoff during and following precipitation and snowmelt events, including surface runoff and drainage. See also “runoff.”

Uncontrolled fill: fill which has been placed under unknown conditions or without any controls such as geotechnical inspection or monitoring.

Unstable slopes: those sloping areas of land which have in the past exhibited, are currently exhibiting, or will likely exhibit mass movement of earth.

Vegetated roof: thin layers of engineered soil and vegetation constructed on top of a conventional flat or sloped roof. All vegetated roofs consist of four basic components: a waterproof membrane, a drainage layer, a light-weight growth medium, and vegetation.

Wall drain: a drainage system behind retaining walls, rockeries, rock walls or modular block walls used to collect water moving through the soil or rock behind the wall or rockery.

Water Quality Standards: the Surface Water Quality Standards, Chapter 173-201A WAC, Ground Water Quality Standards, Chapter 173-200, WAC, and Sediment Management Standards, Chapter 173-204 WAC, now or as hereafter amended.

Waters of the State: includes those waters as defined as “waters of the United States: in 40 CFR Subpart 122.2 within the geographic boundaries of Washington State and “water of the state” as defined in Chapter 90.48 RCW, now or as hereafter amended, which includes lakes, rivers, ponds, streams, inland waters, underground waters, salt waters and all other surface water and water courses within the jurisdiction of the State of Washington.

CG1 – 05 ABBREVIATIONS AND ACRONYMS

The following acronyms or abbreviations may appear in this document Codes and Standards

BCC Bellevue City Code

BUDES Bellevue Utility Department Engineering Standards

IBC International Building Code (current edition adopted by COB)

IRC International Residential Code (current edition adopted by COB)

LUC City of Bellevue Land Use Code

RCW Revised Code of Washington (Laws of the State)

SWMMWW 2012 Stormwater Management Manual for Western Washington, as amended in December 2014 (Ecology Manual)

WAC State of Washington Administrative Code

Terms: These abbreviations are used in plans and specifications as defined here:

- ATB Asphalt Treated Base
- BMP Best Management Practice
- BTD City of Bellevue Transportation Department
- BUD Bellevue Utility Department
- CESCL Certified Erosion and Sediment Control Lead
- CKD Cement Kiln Dust
- COB City of Bellevue
- CPESC Certified Professional in Erosion and Sediment Control
- CPSWQ Certified Professional in Storm Water Quality
- C&G Clearing & Grading
- CSWPPP Construction Stormwater Pollution Prevention Plan
- DFW Washington State Department of Fish and Wildlife
- DNR Washington State Department of Natural Resources
- DOE Washington State Department of Ecology
- DSD City of Bellevue Development Services Department
- EPA Federal Environmental Protection Agency
- ESC Erosion and Sediment Control
- HPA Hydraulic Project Approval (by DFW)
- IBC International Building Code
- ISA International Society of Arboriculture
- NPDES National Pollutant Discharge Elimination System
- NGPE Native Growth Protection Easement
- NRCS Natural Resources Conservation Service (Dept. of Agriculture)
- NTU Nephelometric Turbidity Unit (A unit of turbidity measurement)

ROW City of Bellevue Right-of-Way

SEPA State Environmental Policy Act

TESC Temporary Erosion and Sediment Control

WSDOT Washington State Department of Transportation

CHAPTER CG2 – PERMIT REQUIREMENTS

CG2 – 01 GENERAL

The purpose of clearing & grading permits is to ensure that the proposed work complies with codes enacted to prevent potential adverse impacts associated with land disturbing activities and to provide for and promote the health, safety and welfare of the general public. Permit requirements are provided in section 23.76.035 of the clearing and grading code.

CG2 – 02 CLEARING AND TREE REMOVAL

CG2-02.1 Clearing

The act of clearing means destruction or removal of existing soil cover, both vegetative and non-vegetative. “Soil cover” includes any vegetative or non-vegetative material that provides a barrier to soil erosion. Vegetative cover includes, but is not limited to, the following:

- grass
- weeds
- groundcover
- brush
- shrubs
- the canopy of trees

Non-vegetative cover includes, but is not limited to, the following:

- rocks
- mulch (wood, bark, compost, rock, stone, paper, etc.)
- wood
- asphalt concrete
- cement concrete
- bricks
- glass
- ceramic
- pavers
- metal
- plastic
- lumber
- paper
- automobiles
- appliances
- trash

Cutting of vegetation to ground level, or near ground level, such that the underlying soils are exposed is considered clearing. Destruction of vegetation with chemicals or by burying with soil is also considered clearing. Clearing does not include trimming or pruning that does not result in the death of the vegetation, such as mowing grass and minor trimming or pruning of vegetative cover.

A clearing and grading permit is required for any project which involves clearing of over 1,000 square feet as measured at ground level within any 1-year period. A permit is also required for any clearing in a Critical Area (see Section CG2-06).

CG2-02.2 Tree Removal

Tree removal means any action that results in the death of or severe decline of a tree. Methods of tree removal include but are not limited to:

- Topping, heading, pollarding, or the use of indiscriminate pruning methods that results in the loss of 25% or greater of live tree canopy (unless historical evidence exists to show such pruning has taken place legally);
- Girdling of the tree (removal of a strip of bark, including the cambium layer, around the circumference of a significant portion of the main stem(s));
- Application of herbicides that kill or damage the tree;
- Cutting off or damage to main tree roots that results in the death of the tree or require actions to remove a significant portion of the tree for safety;
- Severe compaction of the soil of or changes of soil grade within the critical root zone;
- Significant mechanical damage to the tree trunk or other main stems, or;
- Removal of 25% or more of the live crown of a tree

The most recent version of the [City of Bellevue Pruning Guidelines](#) presents pruning techniques that reflect industry standards and acceptable best management practices for trees in the city.

A clearing and grading permit is required a project that any of involves the following:

- Removal of more than five (5) significant trees from a property within any three-year period.
- Removal of five (5) or fewer significant trees plus removal of trees not meeting the definition of “significant” plus any other clearing where the project clearing total is over 1,000 square feet. In this case, the significant trees that are removed will count toward the limit of five (5) within any three-year period.
- Removal of more than 25 percent of the live crown of any significant tree that is required to be preserved by city code, plat condition or another requirement
- Removal of any significant tree from any lot in an R-1 land use district in the Bridle Trails subarea.

CG2 – 03 GRADING

Grading is defined as the removal or placement of material such as earth, soil sand, peat, gravel, rock, asphalt, concrete, or other solid material. A permit is required for grading when the total amount of grading exceeds 50 cubic yards. A permit is also required for any grading in a Critical Area (see Section CG2-06). Total grading is calculated by determining the quantities of fill and excavation separately and adding them together, even if the excavated material is used as fill on the same site.

CG2 – 04 HARD SURFACE

A clearing and grading permit is required for 2,000 square feet or more of new plus replaced hard surface area within a 1-year period. Hard surface is defined in Section CGI – 04 above, and includes impervious surfaces, permeable pavement, and vegetated roofs. Regardless of permitting requirements, creation of additional impervious surface service may be limited by the dimensional requirement of the Land Use Code (20.20.010 LUC and 20.25D.080 LUC),

CG2 – 05 ROCKERIES AND MODULAR BLOCK WALLS

Construction or reconstruction of any rockery or modular block wall over 4 feet in height requires a clearing and grading permit (a separate building permit is not required for rockeries or modular small-block walls). The height is measured from the bottom of the base rock or block to the top of the top rock or block. The base rock or block is the bottom-most rock or block that is not entirely below grade (see Figure 1). For tiered rockeries where the sum of the heights of the tiers is over 4 feet, the tier segments must be separated horizontally a distance equal to at least the height of the lower segment (see Figure 2), unless an engineered design is provided.

Shoring, cast-in-place and pre-cast concrete retaining walls, timber retaining walls, and modular large-block (ecology block) walls 3 blocks or more in height (gravity wall with no soil reinforcing) are regulated under the requirements of the current building codes (IBC or IRC) and may require a building permit. A clearing and grading permit may also be required if the associated work involves clearing and/or grading over the thresholds described above.

CG2 – 06 CRITICAL AREAS

A clearing and grading permit is required for any land disturbing activities in any critical area or critical area buffer, when allowed by the Land Use Code. The Land Use Code generally does not allow land disturbing activities in critical areas with some exceptions (20.25H LUC). Critical areas include:

- Streams and the associated buffers
- Wetlands and the associated buffers
- Shorelines and the associated buffers
- Geologic Hazard Areas and the associated buffers
- Habitat Associated with Species of Local Importance and the associated buffers
- Areas of Special Flood Hazard.

Additional requirements or limitations may apply when conducting land disturbing activities in the shoreline (see the Bellevue Land Use Code, Part 20.25E, Shoreline Overlay District, now or hereafter amended). Land disturbing activities in portions of the critical areas, if allowed by the Land Use Code, require environmental review under the State Environmental Policy Act (SEPA) (see the Bellevue Environmental Procedures Code, Chapter 22.02). In-water work will also require a Hydraulic Project Approval (HPA) permit from the Department of Fish & Wildlife (see Section CG5-16).

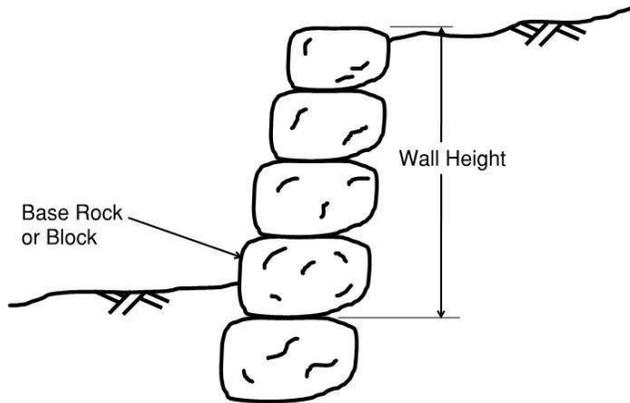


Figure 1 - Rockery or Modular Block Wall Height Measurement for Permitting and Engineering Requirements

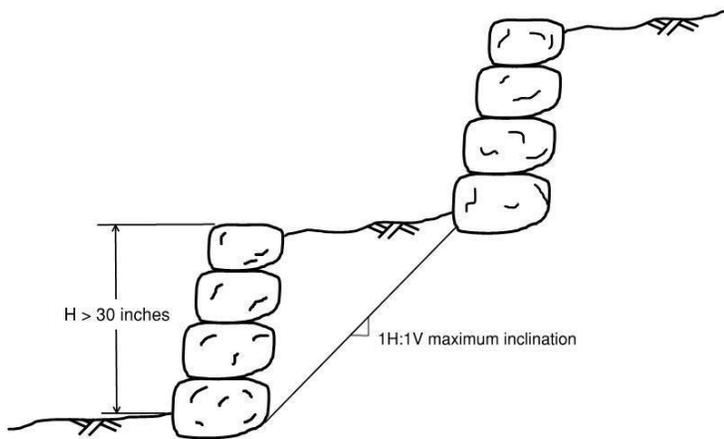


Figure 2 - Segment Setback Requirements for Tiered Rockeries and Block Walls over 30 inches in height

CG2 – 07 EXEMPTIONS

The clearing and grading code provides exemptions from permit requirements for certain types of activities or situations. An exemption from a clearing and grading permit does not exempt the person doing the work from meeting all applicable City codes. Exemptions to the requirements for a clearing and grading permit apply to the following activities:

- Agricultural crop management of existing farmed areas.
- Routine landscape maintenance, as described in LUC 20.25H.055.C.3.h, as now or hereafter amended.
- Work needed to correct an immediate danger to life or property in an emergency as declared by the mayor or the city manager or his/her designee.
- Cemetery graves involving less than 50 cubic yards of excavation, and related filling, per each cemetery plot.
- Routine drainage maintenance of existing, constructed stormwater drainage facilities located outside of a critical area or critical area buffer, including, but not limited to, detention/retention ponds, wetponds, sediment ponds, constructed drainage swales, water quality treatment facilities such as filtration systems, and regional storm facilities that are necessary to preserve the water quality treatment and flow control functions of the facility. This exemption does not apply to any expansion and/or modification to already excavated and constructed stormwater drainage facilities.
- Roadway repairs and overlays within public street rights-of-way for the purpose of maintaining the pavement on existing paved roadways, such that asphalt removal or milling does not expose more than 1,000 square feet of gravel base or subgrade. This exemption does not apply to curbs, gutters, sidewalks, utilities, new traffic calming devices, new roadways, or the widening of the paved surface of existing roadways.

CHAPTER CG3 - PERMIT APPLICATION SUBMITTAL

CG3 – 01 GENERAL

CG3 – 01.1 Permit Types

The Director has categorized clearing and grading permits into different types for administrative purposes. A clearing and grading permit may be issued as a separate permit or as a component of another permit. A permit that encompasses more than one permit type is usually referred to as a “combination permit.” The clearing and grading component may be included in a building permit, a land use approval, or a right-of-way use permit. Also, a clearing and grading permit may include approvals from other departments or sections, including Land Use, Transportation, Utilities, and/or Fire. For larger projects, such as commercial buildings, construction permits (building and clearing & grading) and Land Use approvals are issued separately.

CG3 - 01.2 Submittal Requirements

Copies of current clearing & grading permit submittal requirements are available at the City Hall Permit Center between 8 a.m. and 4 p.m., Monday, Tuesday, Thursday and Friday and between 10:00 and 4:00 on Wednesday. Phone: (425) 452-4898 (assistance for the hearing impaired: dial 711). They are also available on the City’s website at www.bellevuewa.gov.

Clearing & grading permit submittal requirements may be waived or modified only by a clearing & grading reviewer or land use planner on behalf of the Director. Additional submittals may be required by the clearing & grading project reviewer during the project review, including items that were previously waived when that information is necessary to confirm compliance with applicable codes and standards.

Permit types that require report submittals (such as geotechnical reports) are listed on the Clearing & Grading Permits Submittal Requirements sheet. Requirements for report contents are provided in the submittal requirements package. Additional reports may be required by the clearing & grading project reviewer during the project review. The property owner and their agent are responsible for the accuracy and completeness of all information provided with or affecting the application submittal.

After a clearing & grading permit application has been submitted, any proposed changes to the construction plans must be submitted as a revision to the permit application. Revised plans showing the changes must be submitted to the Permit Center for review by the relevant reviewing departments, or on-line through MyBuildingPermit.com. The new plans must be approved by all relevant COB departments prior to issuance of the permit. If revisions are proposed after the permit has been issued, plans with the proposed changes must also be submitted to the Permit Center or on-line through MyBuildingPermit.com for review by the relevant reviewing departments. The revised plans must be approved and issued to the permitted before the changes are constructed in the field.

Procedures for clearing & grading and land use decisions are described in the City of Bellevue Land Use Code Chapter 20.35. Design and construction requirements for clearing & grading permits are detailed in the clearing & grading code (BCC Chapter 23.76).

CG3 – 01.3 Completeness

Clearing and grading permit applications are screened for completeness at intake. Applications that are deemed incomplete by the Permit Technicians are returned to the applicant with a request to include the needed information. If the application is accepted by a Permit Processing technician, and deemed incomplete by any of the reviewers within 28 days of submittal, the application will be labeled “incomplete” in the permit tracking system and the applicant will be sent a revision request for the needed information. No further review will be done by any of the reviewers until the requested information is submitted to a Permit Processing technician. If the permit application is not deemed incomplete within 28 days of application submittal, it will be considered complete.

CG3 – 01.4 Request for Deviation from Clearing & Grading Development Standards

A deviation from the requirements of these standards may be considered by the City for a project design if there are extreme difficulties involved in carrying out the provisions of these standards. A written modification request that addresses the criteria set forth in these standards must be submitted to the project reviewer. The written request must be made on the Alternate Materials, Methods, or Modifications Request Form, and must include plans that are completed by the project design engineer.

The request for deviation from clearing & grading development standards must meet all of the following criteria:

1. The deviation is in conformity with the intent and purpose of the clearing & grading code and development standards;
2. Such deviation provides equivalent environmental and public safety protection; is in the overriding public interest; and meets the objectives of safety, function, and environmental protection;
3. The granting of the deviation will not be detrimental to the public health and welfare, and will not create adverse impacts to nearby property, slopes, water bodies, and surrounding environmental systems; and
4. The deviation provides the least possible deviation from the requirements of the clearing & grading code and other city codes.

The following information must be included on an “Alternate Materials, Methods, or Modifications Request Form” to request a deviation from clearing & grading development standards:

1. Clearly identify the specific sections and requirements of the development standards to be modified;
2. Describe the design proposed to mitigate impacts created by the deviation; and
3. Submit all relevant review information, such as preliminary approval conditions, vicinity maps, photographs, engineering plans, or sketches to illustrate the impact of applying the deviation to the project.

CG3 – 02 PLANS & DRAWINGS

CG3–02.1 General

Plans and drawings submitted for review must be in accordance with the City's "Standards for Plans & Drawings" requirements. Current copies of these requirements are available at the City Hall Permit Center or from the City's website at www.bellevuewa.gov. Plans that may be required include:

- Boundary & topographic survey
- Site plan B
- Construction Storm Water Pollution Prevention Plan (CSWPPP)
- Clearing & grading and erosion and sedimentation control (ESC) plan (included with the CSWPPP)
- Road plan
- Final landscape plan
- Street lighting plan
- Turbidity and pH monitoring plan

For each of these plans or drawings, the City provides a submittal requirement sheet that describes in detail what information must be provided. These submittal requirement sheets are available at the Permit Center and City Hall or on the website at: <https://development.bellevuewa.gov/permits-and-inspections/permits-and-forms/forms-and-publications/>

CG3 – 02.2 Combining Plans

The site plan identified for the permit should be used as the underlying base map for the clearing & grading plan and the ESC Plan. The site plan, clearing & grading plan, and the ESC plan can be combined on one sheet for smaller projects, provided the elements of each plan can be easily read. For larger projects, the site plan is on a separate sheet and the clearing & grading and ESC plans are combined on a single sheet. If the project is large and complex, the clearing & grading and ESC plans are on separate sheets.

CG3 – 03 WRITTEN REPORTS AND PLANS

CG3 - 03.1 Construction Stormwater Pollution Prevention Plan (CSWPPP)

All new development and redevelopment projects are responsible for preventing erosion and discharge of sediment and other pollutants into receiving waters. A Construction Stormwater Pollution Prevention Plan (CSWPPP) is required for all projects that meet the thresholds for permitting in section 23.76.035 of the clearing and grading code. The CSWPPP must be implemented beginning with initial soil disturbance and until final stabilization. Sediment and Erosion control BMPs shall be consistent with the BMPs contained in these standards.

The CSWPPP must include a narrative, drawings, and a turbidity and pH monitoring plan. The required elements of a CSWPPP are described below in Section CG7, Construction Stormwater Pollution Prevention. All BMPs must be clearly referenced in the narrative and marked on the drawings, and a copy of the referenced BMPs must be included in the CSWPPP. The CSWPPP narrative shall include documentation to explain and justify the pollution prevention strategies made for the project. Permitted

clearing and grading areas and any other areas required to preserve critical or sensitive areas, buffers, native growth protection easements, or tree retention areas as may be required by the city, must be delineated on the site plans.

Appendix A, Planning details the required contents of a CSWPPP. A worksheet for completing a CSWPPP is provided in Appendix C.

For projects that involve clearing less than 7,000 square feet and grading less than 1500 cubic yards, the CSWPPP may consist of a completed “CSWPPP Short Form for Small Construction Projects” and a site plan that includes ESC. A blank CSWPPP Short Form for Small Construction Projects is provided in Appendix C.

The requirement for a turbidity and pH monitoring plan may be waived by the Director, depending on site characteristics, such as topography, soil type, proximity to receiving waters, retention of vegetation, extent of land disturbing activities, or location of critical areas and critical area buffers.

GC3 – 03.2 Geotechnical Report

A geotechnical report must be submitted with most clearing & grading and building permit applications. A geotechnical report & stability analysis requirements sheet is provided in Appendix C and is included in the submittal requirements packet. The sheet explains when a geotechnical report is required and what must be included in the report.

Geotechnical report submittal requirements may be waived or modified only by a clearing & grading reviewer or land use planner on behalf of the Director. City reviewers may also require additional geotechnical information submittals during permit review.

Applicants for single family clearing & grading permits that require a site geotechnical report or letter may submit the report for the associated plat or short plat unless specific information regarding the parcel and the proposal is required by the plat conditions or the DSD reviewer.

A new geotechnical report may not be required for a clearing and grading permit application if a prior geotechnical report (no more than 5 years old) for the project on the same property is provided. For projects where the geotechnical report is more than 5 years old and for sites where the original project has changed, the clearing & grading reviewer may require a letter from the geotechnical engineer. The letter must state that the recommendations and conclusions in the report are relevant to the current proposed project, and/or provide additional information as needed.

Geotechnical Report Addendum:

If the original geotechnical report for a proposed project was a “preliminary” geotechnical report, an addendum to the preliminary report must be submitted to the clearing & grading reviewer before the permit can be issued. The geotechnical engineer must review the latest revision to the clearing and grading plans and prepare the geotechnical report addendum that includes:

1. New site information discovered since the date of the preliminary report;
2. Verification that the proposed project is designed following the recommendations in the preliminary geotechnical report;
3. Revised recommendations for construction, based on any new information; and
4. The addendum report must be stamped with the engineer's professional seal and signed.

Geotechnical Construction Summary Report

A summary report is required if construction monitoring is provided by the geotechnical engineer. The Geotechnical Construction Summary Report must include:

1. Description of the construction techniques used;
2. Compaction test results and the results of any analyses of the materials that were used;
3. A description of any conditions found in the field that varied from conditions as described in initial geotechnical reports and how the variations affected the project;
4. A comparison of the previously approved plans with the as-built improvements;
5. Other information which may be deemed pertinent by the geotechnical engineer, the clearing & grading reviewer or the clearing & grading inspector; and construction summary reports must be submitted to the clearing & grading inspector prior to the issuance of any Certificate of Occupancy, or final approval by the inspector.

CG3- 03.3 Turbidity & pH Monitoring Plan

Turbidity and pH monitoring is required for all projects with land disturbing activities over 7,000 square feet, unless waived by the clearing & grading reviewer on behalf of the Director. The turbidity and pH monitoring plan must be included in the CSWPPP and must include the elements presented in the Turbidity and pH Monitoring Requirements provided in Appendix C and included in the submittal requirement packet. CG3 – 04 APPLICATION FORMS AND OTHER DOCUMENTS

CG3- 04.1 Application Forms

Forms required for a complete application may include, but are not limited to, Submittal Requirements form, Application form, and "Bill To" form. These forms are included in the submittal packet as needed for each application type.

CG3- 04.2 Rights of Entry and Construction Easements

Rights-of-entry or temporary or permanent construction easements may be necessary if clearing & grading and construction is planned on easements or on adjacent properties. Copies of all rights-of-entry or offsite construction easements must be submitted to the clearing & grading reviewer prior to the approval of any clearing and grading permit.

Erosion and sedimentation control must be included on the ESC plans for all off-site work, including utility installation in the ROW.

CG3- 04.3 Abatement Security

An abatement security device is collected for permitted clearing and grading projects to correct or eliminate problems related to earth or water resources, either on or off-site, caused by project clearing and grading. An abatement security device is required for all projects that are not individual single-family homes and that involve more than 5,000 square feet of clearing and/or more than 250 cubic yards of excavation and/or fill. In addition, the Director may require an abatement security device for other projects, including individual single-family homes, that can cause problems related to earth and water resources such as erosion and sedimentation or slope instability. The abatement security device must be established and an original of the signed forms must be submitted to the clearing and grading reviewer before the permit can be issued.

The amount of the abatement security device, usually in the form of an assignment of savings, an irrevocable letter of credit, or a bond, is determined by the clearing & grading reviewer, usually based on an estimate of the erosion control value of the erosion and sediment control BMPs provided by the applicant or the applicant's engineer.

If the City finds it necessary to expend all or part of the abatement security device for corrective work, a stop work order will be issued, prohibiting any additional work until the permittee re-establishes the original amount of the abatement security.

The City will release the abatement security once final clearing and grading approval has been given. Interest from any interest-bearing form of the abatement security device will accrue to the depositor.

CG3 – 05 PROFESSIONAL QUALIFICATIONS

City of Bellevue codes contain minimum standards for professional licensing or certification of engineering, design, and environmental disciplines. The following requirements apply to clearing & grading permit applications.

CG3- 05.1 Engineering

Civil Engineer

Plans for clearing, grading and erosion control shall be prepared and signed by a professional Civil Engineer (PE), licensed in the State of Washington, who has significant professional experience and education in the design of grading, erosion and drainage control, and site development.

Plans prepared for a Single Family Building Permit are generally exempted from the professional engineering requirement. A clearing & grading reviewer will be able to answer questions regarding engineering requirements.

Engineering Geologist

An Engineering Geologist must be licensed by the State of Washington in the specialty of engineering geology. The Engineering Geologist may provide stand-alone designs for cuts, fills, roads, trails, utilities, rockeries and modular block walls.

Geotechnical Engineer

The Geotechnical Engineer must be a professional Civil Engineer (PE), licensed in the State of Washington, and qualified by experience and education in the practice of geotechnical engineering. The applicant must designate the engineer the Geotechnical Engineer of Record for the project.

Change of Engineer

If the Civil Engineer or the Geotechnical Engineer of Record is changed by the applicant during permit application review, the applicant must submit the name and firm of the new engineer in writing to the clearing & grading reviewer. If the Civil Engineer or the Geotechnical Engineer of Record is changed by the applicant during construction, the permittee must submit the name and firm of the new engineer in writing to the clearing & grading reviewer and to the clearing & grading inspector.

CG3-05.2 Landscape Design

Landscape designs required under the LUC (20.20.520.D) must be executed by a registered Landscape Architect, Washington Certified Nurseryman, or Washington Certified Landscaper.

CG3-05.3 Certified Erosion and Sediment Control Lead (CESCL)

The project certified erosion and sediment control lead (CESCL) must be certified as described in Appendix B, Standards and Specifications for Best Management Practices, BMP CI60, Conditions of Use.

CG3-05.4 Arborist

Project arborists must be certified by the International Society of Arboriculture (ISA).

CG3-05.5 Other Professionals

For professions for which there is no license or certification, a qualified professional is a person who meets the definition in LUC 20.50.042

CHAPTER CG4 – PERMIT ISSUANCE

CG4 – 01 ASSOCIATED PERMITS AND APPROVALS

Clearing and grading permits can generally be issued only in conjunction with, or as part of, one or more permits or approvals. Section 23.76.040.A of the clearing and grading code describes which permits and/or approvals must accompany a clearing and grading permit. Section 23.76.040.B. describes the criteria where a clearing and grading permit can be issued without an accompanying permit or approval.

CG4-01.1 Land Use Approvals

Land Use approvals associated with a clearing & grading permit generally must be issued before the clearing and grading permit can be issued. Land use approvals include the following:

- Design Review
- Conditional use permit
- Planned unit development approval
- Preliminary plat or short plat approval
- Critical Areas land use permit
- Shoreline conditional use permit
- Shoreline substantial development permit
- Shoreline management exemption
- Temporary use permit
- Variance

CG4-01.2 Construction Permits

A clearing & grading permit may be issued before an associated building permit is issued provided that a complete and valid building permit application has been submitted. For demolition of a building where clearing grading is required, the demolition permit must be issued before or concurrently with the clearing and grading permit.

Other permit approvals are often required before the clearing and grading permit can be issued or before construction can commence. Additional construction permits that may be required include, but are not limited to, the following:

1. Building, Land Use, and Clearing & Grading Permits
 - Clearing & grading permits for stockpiling, mobilization, or preloading
 - Building department permits for demolition, accessory structure (vaults/walls) or shoring
 - Land use permits for off-site construction parking, staging, or stockpiling (temporary use permit)
2. Transportation Permits
 - Valid right-of-way use permit application for haul routes, if required, must be submitted before the clearing and grading permit can be issued.

3. Utility Permits

- A utility permit is required for abandonment, construction, and connection of utilities.
- A utility system extension agreement must be submitted concurrently with the clearing and grading permit application.

CG4-01.3 Permits from other jurisdictions

The applicant is responsible for determining whether it is necessary to obtain Federal, State and County permits, and for obtaining these permits from the appropriate jurisdiction.

A copy of the conditions of approval for permits issued by other governing agencies may be required by the clearing & grading reviewer prior to clearing & grading permit approval.

Below is a list of common outside permits or approvals that apply to construction projects. Others may also apply.

Forest Practices Approval (issued by DNR)

Approval to discharge construction stormwater to sewer (issued by King County) Joint Application for Hydraulic Project Approvals (HPA) (issued by DFW)

Approval for use of chemical treatment BMPs (issued by DOE) Shoreline Management Permits

Exceedance of Water Quality Standards Approvals Water Quality Certifications National Pollutant Discharge Elimination System (NPDES) Permit (issued by DOE) Removal or abandonment of any underground storage tanks

Well abandonment (issued by King County)

CG4 - 02 VESTING AND EXPIRATION OF PERMITS AND APPLICATIONS

CG4-02.1 Projects Requiring Only Clearing and Grading Permits

- 1) Vesting Date. An application for an independent clearing and grading permit vests to the clearing & grading code (BCC Chapter 23.76), the storm and surface water utility code (BCC Chapter 24.06), and the corresponding development and engineering standards. The application vests on the date that a complete clearing and grading permit application is submitted consistent with the requirements of BCC 23.76.035.E.
- 2) Expiration of Vested Status.
 - a) Before issuance, an application for clearing and grading permit expires as follows:
 - i) An application for a clearing and grading permit for which no permit is issued within one year following the date of application expires by limitation. Plans and other data submitted for review may then be returned to the applicant or destroyed in accordance with state law. The Director may, prior to expiration, extend the time for action by the applicant for a period of not more than 180 days.

- ii) An application for a clearing and grading permit may be cancelled for inactivity if an applicant fails, without reasonable justification, to respond to the department's written request for revisions or corrections within 90 days. The Director may extend the response period beyond 90 days if the applicant provides and adheres to a reasonable schedule for submitting the full revisions.
- iii) In addition to the extension allowed above, the Director may extend the life of an application if any of the following conditions exist:
 - (1) Compliance with the State Environmental Policy Act is in progress; or
 - (2) Any other city review is in progress; provided the applicant has submitted a complete response to city requests or the Director determines that unique or unusual circumstances exist that warrant additional time for such response, and the Director determines that the review is proceeding in a timely manner toward final city decision; or
 - (3) Litigation against the city or the applicant is in progress, the outcome of which may affect the validity or the provisions of any permit issued pursuant to such application.
- iv) In no event may the Director extend the application for a period of more than 180 days following the conclusion of the applicable condition described above.
- b) After permit issuance, the clearing and grading permit expires as follows:
 - i) The permit expires if the authorized work is not begun within one year from the date of permit issuance, or if work is abandoned for over 180 days.
 - ii) If the authorized work is continually performed, the permit expires one year from the date of issuance unless a different time frame is specified on the permit or an extension is granted. Two one-year extensions may be granted by the Director; provided, that conditions which were relevant to issuance of the permit have not changed substantially and no material detriment to the public welfare will result from the extension. The two one year extensions are usually automatically granted upon issuance of the permit.
 - iii) If the clearing and grading permit is revoked by the Director or otherwise cancelled, the vested status of the clearing and grading permit expires on the date of revocation or cancellation.

CG4-02.2 Projects Requiring Prior Discretionary Land Use Permit or Approval

1. Vesting Date. The vesting date for a clearing and grading permit requiring a prior discretionary land use permit or approval is contingent on the level of engineering detail provided by the applicant as described below:

- a. Engineering Details Provided. For applicants that satisfy the clearing and grading submittal requirements, and satisfy the Storm and Surface Code submittal requirements for site development engineering, the vesting date to the clearing and grading code, the storm and surface water utility code, and the corresponding development and engineering standards, is the date of issuance of the discretionary land use decision.
- b. Conceptual Details Provided. For applicants that choose not to provide submittal requirements for site development engineering, the vesting date to the clearing and grading code, the storm and surface water utility code, and the corresponding

development and engineering standards, is the date that a complete building permit is submitted.

2. Expiration of Vested Status.

- a. Clearing and Grading Permit Vested with a Discretionary Permit or Approval. The vested status of a clearing and grading permit with a vesting date established pursuant to CG4 – 02.2 – I.a above, runs with the vested status of the underlying land use permit or approval and expires per the terms of the administration and enforcement section of the land use code (LUC 20.40.500).
- b. Clearing and Grading Permit Vested with a Complete Building Permit Application. The vested status of a clearing and grading permit with a vesting date established pursuant to paragraph CG4 – 02.2 – I.b above, expires as follows:
 - i) Before Building Permit Issuance. The vested status of the clearing and grading permit runs with the vested status of the building permit application and expires per the terms of the construction code administration (BCC 23.05.090.H).
 - ii) After Building Permit Issuance. The vested status of the clearing and grading permit runs with the vested status of the issued building permit and expires per the terms of the construction code administration (BCC 23.05.100.E). The vested status of the clearing and grading permit is automatically extended for the life of the building permit. If the building permit expires, or is revoked or cancelled, then the vested status of a clearing and grading permit also expires, or is revoked or cancelled.

CG4-02.3 Projects Requiring Building Permits and No Prior Discretionary Land Use Permit or Approval

1. Vesting Date. A clearing and grading permit for a project that requires building permits and no prior discretionary land use permit or approval, vests to the clearing and grading code, the storm and surface water utility code, and the corresponding development and engineering standards, on the date that a complete building permit application is submitted.
2. Expiration of Vested Status.
 - a. Before Building Permit Issuance. The vested status of the clearing and grading permit runs with the vested status of the building permit application and expires along with the building permit application.
 - b. Post Building Permit Issuance. The vested status of the clearing and grading permit runs with the vested status of the issued building permit and expires along with the building permit. The vested status of the clearing and grading permit shall be automatically extended for the life of the building permit. If the building permit expires, or is revoked or cancelled, then the vested status of a clearing and grading permit shall also expire, or be revoked or cancelled.

CHAPTER CG5 – STANDARDS FOR CLEARING & GRADING

CG5 – 01 GENERAL

Clearing & grading within the City of Bellevue is subject to the requirements and restrictions in these standards, the clearing & grading code, and all other applicable City of Bellevue codes. Land disturbing activities that require a clearing and grading permit are listed in Section Chapter CG2, Permit Requirements. Projects that do not meet these thresholds are subject to the above-mentioned codes, but are not subject to the review and inspection associated with larger projects.

Vegetative cover plays an extremely important role in controlling erosion on construction sites. In most cases, existing, natural vegetation provides the greatest protection of soil surfaces from erosive forces. Grading can have adverse effects on the environment by loosening of soil and making it more susceptible to erosion, changing drainage patterns, possibly reducing the stability of slopes, and creating an inhospitable environment for new plant growth through removal of organic material and compaction.

Bellevue’s Comprehensive Plan policies seek to preserve and maintain natural vegetation and existing grades, where possible, for erosion and sedimentation control and water quality and quantity control. As such, clearing and grading for other than approved development proposals is generally prohibited.

CG5 – 02 PRESERVING NATURAL VEGETATION

Preserve existing vegetation on sites in areas where no construction activity is planned or will occur at a later date. BMPs CI01, CI02, CI03 and CI04 provide methods of preserving and protecting vegetation that will provide erosion and sediment control during construction. Areas where vegetation is to be preserved must be shown on the ESC plan.

CG5 – 03 CLEARING AND GRADING AROUND TREES TO BE PRESERVED

The City of Bellevue Land Use codes require that certain trees be retained as a condition of approval on many development projects. Trees are required to be preserved for several reasons, including maintaining the urban forest, reducing stormwater runoff and erosion, providing habitat for wildlife, and for aesthetic reasons.

Trees can be impacted during construction and often the damage is not seen for several months or years after construction. Proper tree protection can benefit not only the tree by reducing stress during construction, but also the developer and property owner by reducing long term costs associated with future maintenance.

The clearing and grading code requires that a tree preservation plan be incorporated into the clearing and grading drawings. The tree preservation plan must be prepared by a certified arborist or a registered landscape architect, and must define spatial limits for tree protection and include detailed drawings of tree protection measures and all required mitigation plantings.

CG5 – 04 PROTECTION OF SOILS FOR ON-SITE STORMWATER MANAGEMENT

On-site stormwater management can include several stormwater BMPs that use the native soils for infiltration, dispersion, and retention of stormwater. Such BMPs include bioretention, pervious pavement, and amended soils. These BMPs are designed using, among other variables, the measured infiltration capacity of site soils. Soil infiltration capacity can be adversely affected during construction from compaction of the soil and clogging from sediment; therefore, care must be taken to protect native soils in areas where on-site stormwater BMPs are to be constructed. These areas must be shown on the ESC plan, and appropriate erosion and sediment control methods must be included in the CSWPPP. BMPs CI01, CI02, CI03, CI04 and TI01 may be appropriate for providing erosion and sediment control for on-site soils. Completed on- site stormwater facilities must also be protected until the site is stabilized.

CG5 – 05 CLEARING AND GRADING FOR PLATS AND SHORT PLATS

Section 23.76.040 of the clearing and grading code limits land disturbing activities under permits issued for preliminary plat or short plat approvals to infrastructure construction only, and does not allow for clearing or grading of building sites. Section 23.76.042 of the clearing and grading code allows the Director to approve clearing of building sites, provided certain criteria are met. The criteria are listed in section 23.76.042.A. For approval to clear building sites during plat infrastructure construction, a written request must be sent to the clearing and grading reviewer during review of the clearing and grading permit application.

CG5 – 06 GRADING ADJACENT TO SENSITIVE AND CRITICAL AREAS

Heavy equipment is not allowed in buffers for wetlands, streams, and slopes unless approved in advance by DSD. Constructed slopes must be graded and compacted in a manner that protects adjacent sensitive and critical areas during and after construction. On the clearing & grading plans and on the ESC plan, the applicant must show the dimensions for construction access that will be used to construct proposed walls, rockeries, and roadway embankments located adjacent to sensitive and protected areas. Include these access areas in the disturbance limits for the project.

CG5 - 07 GRADING AROUND STRUCTURES

Final site grading must direct drainage away from all building structures, as directed by the IBC or the IRC.

CG5 – 08 EXCAVATION AND FILLING

All movement of earth materials must be done in a manner that will minimize erosion and sedimentation. Soil stockpiles, exposed slopes, and disturbed areas must be covered in accordance with BMP CI23. Excavation and filling are limited to the area inside of the grading limits that are shown on the approved clearing and grading permit plans.

CG5 – 09 ENGINEERED FILL AND REINFORCED FILL

Engineered fill and reinforced fill must be placed and compacted as specified by the project geotechnical engineer. During construction, the compacted soils must be monitored and/or tested by the geotechnical engineer. The monitoring and/or testing must include an evaluation of the subgrade onto which the fill is to be placed; evaluation and approval of fill soil type, moisture content and lift thickness; placement of reinforcing elements; and moisture and density testing.

The engineer's field testing reports must be submitted to the clearing & grading inspector daily. Areas of engineered and/or reinforced fill must be shown on the grading plans.

CG5 – 10 SOIL AMENDMENTS

Cement kiln dust (CKD) may not be used as a bulking agent for site dewatering, for stabilizing or lowering the moisture content on-site or fill soils. Cement may be used if appropriate pH testing is conducted, water treatment is provided as needed to meet water quality standards, and dust control is implemented during cement application and mixing. Cement treatment must be approved by the clearing and grading reviewer before cement application.

If polymers are to be added to soils to prevent dust or to control erosion, approval must be obtained from the Washington State Department of Ecology (Ecology). Runoff from polymer treated areas must be collected in a sediment pond. The effluent must be tested and treated before being released to the storm drain or to the sanitary sewer.

CG5 – 11 ROCKERIES AND MODULAR BLOCK WALLS

CG5-11.1 General

Rockeries and modular block walls are treated similarly with respect to height, permit requirements, drainage, and setback requirements. Rockeries and modular block walls over 30 inches in height are considered structures in the Land Use Code and are; therefore, not allowed in structure setbacks (LUC 20.20.025. D.). An exception is allowed if there is no feasible alternative to location or height, based on the existing grade. For determining wall height in setbacks, walls are measured from finished grade to the top of the rockery or modular block wall. Where rockeries or modular block walls are stepped or tiered in a structure setback, there must be at least 30 inches of separation between the segments. The separation must be measured from the face of one rockery at its base at grade to the face of the next rockery at its base at grade (see Figure 3).

GC 5-11.2 Rockeries

Rockeries or rock walls serve as a protective facing against an exposed cut soil face in native soils or as a protective system against the face of engineered fill or reinforced fill. Rockeries are not considered to be retaining walls, and, as such, are not allowed where the soil face is uncontrolled fill over 4 feet in height. In no case are rockeries allowed to exceed 12 feet in height. Rockeries over 4 feet in height are required to be designed by a geotechnical, civil, or structural engineer and must include a wall drain. The locations of rockeries must be shown on the grading plan and must include the top and bottom elevations at the ends, the midpoint and at the maximum height.

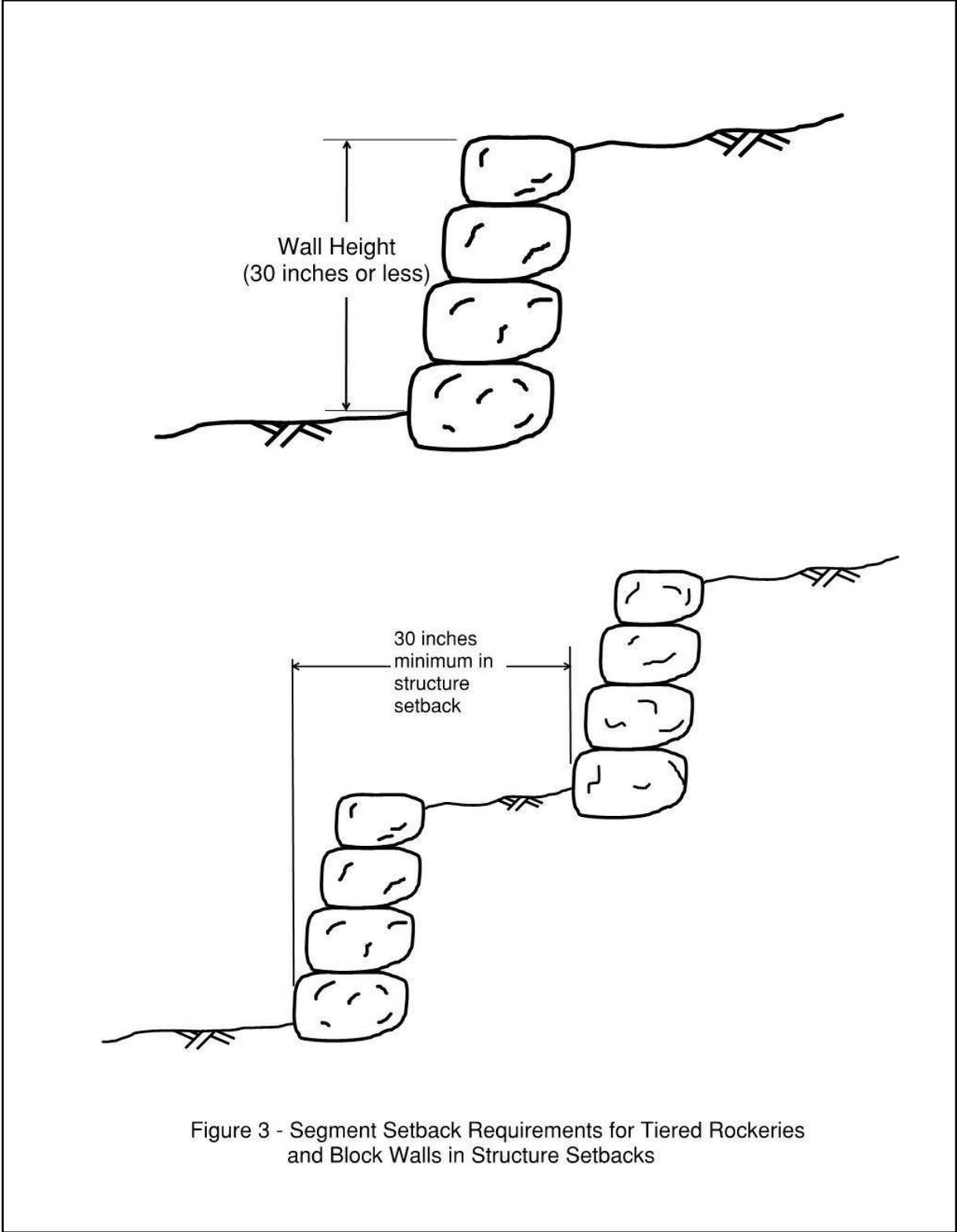


Figure 3 - Segment Setback Requirements for Tiered Rockeries and Block Walls in Structure Setbacks

CG5-11.3 Modular Block Walls

Modular block walls are walls constructed of manufactured concrete units acting as a protective facing for an exposed soil face, as a facing for a reinforced soil mass, or as gravity retaining walls. Modular blocks are manufactured in two general sizes; small blocks, such as Keystone® and Allan Block®, which typically weigh less than 120 pounds, and large blocks such as Lock-Block® and Redi-Rock™ where the standard units weigh between 1,000 and 5,000 pounds. Large blocks are commonly referred to as ecology blocks.

The safe height of modular block walls, when used as a protective facing for exposed soils (cut face in native soils or engineered fill), is limited because the soil pressure tends to push the wall over. The safe height of an unreinforced modular block wall depends on the size and weight of the blocks, the batter of the wall face, and the properties of the protected soil. In any case, all modular block walls over 4 feet in height must be designed by a geotechnical, civil, or structural engineer and must include a wall drain.

Modular blocks can also be used in conjunction with soil reinforcement to create a reinforced soil retaining wall. In this case, the reinforced soil acts as the retaining mass, and the blocks act as a protective facing that is attached to the soil mass by the reinforcing elements (typically geogrids). These walls are generally over 4 feet in height and must be designed by a geotechnical, civil, or structural engineer and must include a wall drain.

Large blocks can be configured to form a gravity retaining wall using the mass of the blocks alone (no soil reinforcing). In this case, walls 3 blocks or more in height require a building permit and are regulated under the requirements of the current building codes (IBC or IRC). Large block walls less than 3 blocks high, and large block walls over 4 feet in height with soil reinforcing, are reviewed under a clearing and grading permit.

CG5 – 12 WALL DRAINS

Wall drains are required to be installed behind retaining walls, rockeries, rock walls or modular block walls over 4 feet in height to collect water moving through the soil or rock. The purpose of the drain is to prevent water from building up behind the structure and causing excessive hydrostatic pressures that may result in failure of the structure. A wall drain typically consists of a minimum 4-inch diameter perforated pipe bedded in washed rock and located at the base of the rockery or wall. If a collection pipe is used, it must discharge to an appropriate drainage location. A wall drain can also be designed to use granular material without a collection pipe; however, it must provide sufficient relief of hydrostatic pressure and it must discharge to a location that does not cause damage to nearby property. Wall drains must be included in the rockery or wall design provided by the geotechnical, civil, or structural engineer. The location of all wall drains and their point of discharge must be shown on the clearing and grading plans.

CG5 – 13 TEMPORARY SHORING

Temporary shoring for the protection of existing utilities, roadways or adjacent structures may be necessary during construction. Design and construction of temporary shoring must meet the requirements and standards of the IBC. Shoring locations and details must be shown on the clearing & grading plans.

CG5 – 14 BLASTING

Use and storage of explosive materials requires a permit from the COB Fire Department, and is also subject to restrictions in the COB Noise Ordinance. Coordinate with the clearing & grading inspector and the clearing & grading reviewer a minimum of one week prior to the proposed blasting. Notification of the adjacent property owners may be required.

CG5 – 15 BULKHEADS

A bulkhead is a wall or embankment adjacent to a water body used for holding back earth. A “normal protective” bulkhead is constructed at or near the ordinary high water mark to protect a single-family residence and is for protecting land from erosion. A bulkhead cannot be constructed for creating land. Where an existing bulkhead is being replaced, it cannot be constructed further waterward of the existing bulkhead than is necessary for construction of new footings. Design and location of bulkheads must conform to the LUC Shoreline Overlay District (20.25E) requirements.

CG5 – 16 IN-WATER WORK

Anyone who plans to conduct any construction activity that will use, divert, obstruct, or change the natural flow or bed of state waters must do so under the terms of an HPA permit issued by the Washington Department of Fish and Wildlife. An HPA permit normally specifies a window of time to complete the work, called a “fish window,” to minimize the impact on fish residing in or migrating through the work area. In-stream work may require that a stream by-pass be installed to route the stream around the work area during construction. Shoreline work typically requires a silt curtain to separate the work area from other areas of the lake and minimize the spread of sediment that becomes suspended by the activity in the lake.

In-water work will also typically require permits from the City of Bellevue. Required permits include a land use approvals, such as a shoreline or critical areas permits; a clearing and grading permit; and possibly a building permit if a structure, such as a dock or pier, is included in the project.

CG5 – 17 DRAINS

Drains covered under this section include the underground portions of downspout drains, yard drains, retaining wall drains; French drains, interceptor drains, and footing (foundation) drains where these drains are not covered under the Bellevue Utilities Surface Water Engineering Standards or the City of Bellevue plumbing code (BCC 23.60).

Pipes for the drains covered in this section must be smooth wall polyethylene (PE) meeting ASTM F810 or a more durable standard, or smooth wall polyvinyl chloride (PVC) meeting ASTM D2729 or a more durable standard. Use of corrugated HDPE pipe is not permitted due to difficulty with cleaning and problems with buckling, crushing and cracking. Pipes must be a minimum of 4 inches in diameter with cleanouts at 50' intervals, and at all changes of direction totaling 135 degrees or more. Pipe sections must be glued or secured with screws at the joints. If screws are used to secure the joints, each joint must have at least 3 screws (one at the crown and one on each side of the pipe, at or above the spring line). The screws must

be maximum ½-inch long, stainless or galvanized steel, and include flexible sealing washers (such as neoprene). The locations of all drains must be shown on the grading plan.

CG-17.1 Surface-water and Downspout Drains

Surface-water and downspout drains collect water from the ground surface or roof areas and convey it to an appropriate stormwater discharge location such as a rain garden, infiltration trench, municipal storm drain or other storm outfall. The pipes for these drains are solid (non-perforated), but may convey water from a perforated subsurface drain and/or may discharge to an outfall using a perforated pipe, such as in an infiltration trench or level spreader. Wherever a subsurface drain connects to a surface-water or downspout drain, the perforated portion of the pipe must be at least 1 foot vertically upgradient from the connection. Use outlet protection as necessary to reduce water velocity and prevent scour.

CG5-17.2 Subsurface Drains

Subsurface drains collect water from below the ground and include footing (foundation) drains, wall drains, French drains, and interceptor drains. The purpose and use of these drains, excepting foundation drains and deep excavation drains, are described in BMP C205. Foundation drainage requirements for residences are provided in the IRC, Section R405.

Perforated sections of pipe must be installed with the holes down and must be bedded in washed gravel that is at least one sieve size larger than the size of the perforations in the pipe. Wherever a subsurface drain connects to a surface-water or downspout drain, the perforated portion of the pipe must be at least 1 foot vertically upgradient from the connection.

CG5 – 18 UNDERGROUND UTILITY LINES

When constructing underground utility lines, no more trench should be opened than can be completed in a single day. Excavated material must be placed on the uphill side of the trench where consistent with safety and space considerations. Temporary trench dewatering devices must be discharged into a sediment trap or pond. Trenches must be filled at the end of each day unless otherwise allowed by the Director.

Generally, cable, gas, and electric utility installations within new plats are included in the plat infrastructure permit and the locations of the proposed utilities must be shown on the plat engineering plans. Installation of private utilities on a single family lot for new home construction is included in the combination permit for the single family dwelling, and must be shown on the site plan.

A clearing & grading permit is required for installation of private utilities not connected with plat infrastructure construction or construction of a new building, if the installation involves clearing over 1,000 square feet and/or grading over 50 cubic yards. Clearing and grading approval for installation of underground utilities in the public right-of-way is required if the clearing and grading thresholds are exceeded. For utility installations that are entirely within the right-of-way, the clearing and grading approval can be included on the right-of-way use permit.

CG5 – 19 RESTRICTIONS ON CLEARING AND GRADING

CG5-19.1 Temporary Restrictions

Rainy Season Restrictions

From October 1 through April 30, clearing and grading may be permitted to continue or to be initiated, only if the Director grants specific approval per Section 23.76.093.C. of the clearing and grading code. If a clearing and grading permit is issued and the city subsequently issues three stop work orders (or fewer as provided as a condition of the project permit) for insufficient erosion and sedimentation control, the permit will be suspended until the dry season. If the third violation occurs during the dry season, the permit will be suspended until weather conditions are favorable and effective erosion and sedimentation control is in place.

Suspension of Work

When clearing and grading is suspended during the rainy season or interrupted at any time of the year, due to heavy rain or for other reasons, the permittee must stabilize the site and maintain the erosion and sedimentation control BMPs

Heavy Rain

Clearing and grading, including hauling of fill or excavated material, may be temporarily stopped during periods of heavy rain. Heavy rain is defined as a rate greater than or equal to 0.03 inches per 6 minutes or 0.30 inches per hour

CG5-19.2 Noise Restrictions

The City of Bellevue noise control ordinance applies to all commercial and multifamily construction and new single-family homes. Construction noise outside the allowable hours is prohibited per BCC 9.18.040. To be considered a violation, the construction-related noise must be audible across a property line or at least 75 feet from the source. Any violation is a civil noise infraction and the City may assess a monetary penalty to the individual creating the noise. A citation will be issued and a \$250 fine imposed on the first infraction.

Construction-related noise violations are called into 911. Reports of noise violations to the police department are communicated to the Code Enforcement Division and may result in a stop work order.

Construction-related noise is allowed:

7:00 a.m. – 6:00 p.m. on weekdays

9:00 a.m. – 6:00 p.m. on Saturdays

Construction-related noise is not allowed:

Outside of allowable hours, Sundays or the following holidays:

- New Year's Day
- Martin Luther King Day
- President's Day

- Memorial Day
- 4th of July
- Labor Day
- Veteran’s Day
- Thanksgiving Day
- Day after Thanksgiving
- Christmas Day

CG5 – 20 INTERRUPTION, SUSPENSION, OR ABANDONMENT OF WORK

If site work is interrupted or suspended, the permittee must stabilize the site and maintain the erosion and sediment control BMPs. Inspections must be conducted by the permittee on a regular basis and after each significant storm event. BMPs that are not functioning properly must be repaired, and additional BMPs must be installed as necessary to control erosion.

Any site where work has been abandoned must be stabilized with permanent erosion and sediment control. Any areas that are not covered by existing vegetation or permanent improvements such as buildings, parking lots, driveways, decks, walkways, and patios must be permanently stabilized. Permanent stabilization includes turf or sod (BMP CI24), placing topsoil (BMP CI25) followed by planting and/or seeding (BMP CI20), installing permanent erosion control blankets or mats (BMP CI22), mulching, or a combination of these practices that will result in permanent stabilization of the soil. Seeded areas must be stabilized using tackifier, turf reinforcement mats, mulch, hydromulch, or erosion control blankets/mats until the seed has established adequate cover to minimize erosion and remain stable during the wet season.

Permanent mulch must be limited to small areas with minimal slope and must be heavy enough to remain in place during successive wet seasons. Permanent mulch includes gravel and compost. Compost must be placed in a layer at least 4 inches thick. Wood based mulch, such as hog fuel, sawdust, and chipped wood should not be used as permanent erosion control except in very small areas. Straw is not to be used as permanent erosion control.

CG5 – 21 POST-CONSTRUCTION SOILS

For sites that must comply with Minimum Requirement #5, as set forth in BCC 24.06.065, all soils in disturbed areas that have not been covered by impervious surface, incorporated into a drainage facility or engineered as structural fill or slope must be amended with organic matter. Amended soils must meet the specifications of BMP T5.I3, as a part of permanent site stabilization.

CHAPTER CG6 – SLOPES

CG6 – 01 GENERAL

Slope is defined as ground that forms a natural or artificial incline. For the purposes of these standards, slope is calculated using the percent method. Slope percent is defined as ‘rise divided by run’, or the ratio of the vertical grade change (the elevation change) to horizontal distance divided by one hundred. For example, a slope with a 10-foot elevation change over a 25-foot horizontal distance, has a 40% slope.

Constructed or artificial slopes are limited to a gradient of 50% unless a geotechnical engineering report and slope stability analysis is provided and shows that a factor of safety of at least 1.5 for static loads and 1.1 for dynamic loads can be met. Cut and fill slopes (temporary and permanent) must be set back from property boundaries as far as necessary to protect adjacent properties and to prevent damage.

CG6 - 02 TOPOGRAPHY

Topographic surveys shall be stamped by a currently licensed Land Surveyor or the Civil Engineer of Record. Only the area proposed for or adjacent to the land alteration must be surveyed, however, the survey should extend at least 100 feet beyond the property boundaries if feasible. Slopes shall be measured based upon a current field or aerial topographic survey in 2-foot contour intervals accurate to within 1 foot of elevation.

CG6 – 03 GEOTECHNICAL REQUIREMENTS

The geotechnical engineer must perform a preliminary review and evaluation of the stability of natural, temporary, and permanently constructed slopes on or adjacent to the property to be developed. If, in the opinion of the City, the review indicates that the stability of the slopes are reduced by the proposed development, or that the natural slopes may have a factor of safety of less than 2.0 in the static case or 1.5 in a dynamic (seismic) case, then the geotechnical engineer must perform additional, more detailed review and evaluation of the stability of the slope.

A more detailed review and evaluation is also required if the applicant proposes development on a steep slope, a landslide hazard area, the associated buffers or the associated structure setbacks. The standards for slope stability analysis are provided in the Geotechnical Report and Stability Analysis Submittal Requirements sheet provided in Appendix C.

Once the City considers a slope stability study to be complete and accurate, the information within the report shall be considered the best available information until a new slope stability report for the area is completed.

CG6 – 04 FOFNDATION CLEARANCES FROM SLOPES

Constructed slopes should be set back from buildings a sufficient distance to protect building foundations from slope drainage, erosion and shallow failure. Chapter 1805.4 of the International Building Code (IBC) provides clearance, setback and elevation requirements for foundations on or adjacent to slopes.

CG6 – 05 SLOPE DRAINAGE

Cut slopes shall be provided with surface and subsurface drainage as necessary for permanent erosion control and stability. Any drains must be designed by a civil engineer and must discharge it at a location approved by the Director in consultation with the Bellevue Utilities department.

CHAPTER CG7 - CONSTRUCTION STORMWATER POLLUTION PREVENTION

CG7 – 01 GENERAL

The purpose of this chapter is to provide guidance for complying with local, state, and federal environmental laws and for protecting water and earth resources, fish and wildlife habitat, and public health and safety from the potential adverse impacts associated with clearing and grading private and public land in the city. The erosion and sediment control BMPs include Chapters 3 and 4 of Volume II of the 2012 Stormwater Management Manual for Western Washington, as amended in December 2014 (Ecology Manual) plus additional BMPs that reflect local regulations and practices. Chapter 3 of the Ecology Manual presents a step-by-step method for site planning and developing a CSWPPP. Chapter 4 of the Ecology Manual contains BMPs for construction stormwater control and site management.

The Ecology Manual uses the terms “local permitting authority”, “local government” or “local permitting agency”. For these standards, those terms refer to the City of Bellevue.

CG7 – 02 PLANNING

Appendix A contains information consistent with Chapter 3 of Volume II of the Ecology Manual. Chapter 3 provides guidelines and procedures for developing a CSWPPP, including 12 elements to be considered in developing a CSWPPP. Requirements for the narrative and drawings are listed, and a worksheet is included to aid in developing the CSWPPP.

For projects that require a clearing and grading permit and that involve clearing of less than 7,000 square feet and grading less than 500 cubic yards, the City of Bellevue will allow a simpler CSWPPP consisting of a small project short form and a site plan with a simple ESC plan. The CSWPPP Short Form for Small Construction Projects, along with a list of the site plan requirements is provided in Appendix C of these standards.

CG7 – 03 STANDARDS AND SPECIFICATIONS FOR BEST MANAGEMENT PRACTICES

Appendix B of these standards is consistent with Chapter 4 of Volume II of the Ecology Manual. Chapter 4 provides BMPs for source control (Section 1) and for Runoff, conveyance, and treatment (Section 2). Appendix C includes additional BMPs that reflect local regulations and practices. These BMPs are to be used in combination to satisfy each of the 13 elements listed in Chapter 3.

CHAPTER CG8 – INSPECTION

CG8 – 01 INSPECTION BY THE PERMITTEE

In accordance with Element #12 of the Ecology Manual, the permittee is required to inspect, maintain, and repair all erosion and sediment control BMPs to assure continued performance of their intended function. Site inspections must be conducted by a person who is knowledgeable in the principles and practices of erosion and sediment control, and who is on-site or on-call at all times. Site inspections must be conducted at least once every calendar week, and the inspector must summarize the results of each inspection in an inspection report that is entered into the log book. For construction sites of one acre or larger that discharge stormwater to the waters of the state, a Certified Erosion and Sediment Control Specialist (CESCL or CPESC) must be identified in the CSWPPP.

Whenever inspection and/or monitoring reveals that the BMPs identified in the CSWPPP are inadequate, due to the actual discharge of or potential to discharge a significant amount of any pollutant, appropriate BMP or design changes shall be implemented as soon as possible.

The Director shall specify inspection and testing requirements applicable to a given project prior to permit issuance; however, the Director may require additional inspection, testing, or professional analysis and recommendations when conditions exist that were not covered in the permit application documents or were not sufficiently known at the time of permit issuance.

CG8 – 01.1 Recordkeeping and Reporting

A log book must be maintained for all on-site construction activities and must include a record of the implementation of the CSWPPP, any updates to the CSWPPP and the ESC Plan, site inspections, and the results of any stormwater quality monitoring. A Construction Emergency Contact Sheet must also be kept in the log book and updated regularly. A copy of a construction emergency contact sheet for is provided in Appendix C.

Updating of the CSWPPP must be shown on the CSWPPP and on the ESC plan, and must be recorded in the log book. Revisions to the CSWPPP must be recorded within 48 hours of implementing the revisions.

Site inspections must be recorded on a site inspection form and placed in the log book within 24 hours of the inspection. An example site inspection form with instructions is included in Appendix C. The inspection report must include the information provided in the instructions.

Turbidity and pH monitoring must be conducted and reported as described in the “Turbidity and pH Monitoring Requirements” provided in Appendix C. An example data sheet is provided with the turbidity monitoring requirements sheet.

CG8 – 02 INSPECTION BY THE CITY

All projects with a clearing and grading permit are subject to city inspections to ensure compliance with the permit. As a condition of permit issuance, the applicant must grant right of entry for such inspections and city emergency corrective measures.

At a minimum, city inspections are required before clearing, grading, or construction and during construction to verify proper installation and maintenance of required erosion and sediment controls, and upon completion of construction. The Director will specify other stages of work when city inspection is required.

The permittee must request routine inspections through the MyBuildingPermit.com portal. The system is accessible 24 hours a day, seven days a week and provides real-time information.

Clearing & grading inspections can be scheduled up to 3 days in advance, and the permittee can schedule an inspection until 4:30 a.m. to schedule a same-day inspection in most cases.

Inspections can also be requested through the interactive voice response (IVR) system (425-452- 6875) until the IVR system is retired.

Normal inspection time for clearing and grading inspectors is 7:00 am to 2:30 pm Monday through Friday. When inspections are requested outside of those times, special arrangements and additional fees are required. When off-hours inspections are required, the permittee must contact the Inspector or the Inspector's Supervisor at least 72 hours prior to the expected inspection, the date and time will need to be definite. When it is confirmed that the inspection staff is available to perform the inspection, the contractor will be contacted by the inspector to coordinate the inspection time, exchange contact information, etc. A fee will be charged for the off-hours inspection. The amount of the fee is based on the inspection time and date. Inspection time performed, subject to these additional fees, will be posted by the Development Services Inspector in the City's permit tracking system under the permit for which the inspection was performed. All fees are required to be paid within five (5) days of the scheduled off-hours inspection.

CG8 – 03 FINAL APPROVAL

The permittee or contractor must notify the clearing & grading inspector when site construction completed and ready for final inspection. Final clearing & grading approval will be given upon completion of the following tasks:

- All permanent erosion control measures are installed (or bonded for, in the case of plats);
- All items on the final clearing & grading check list are completed; and
- All necessary reports have been submitted to the City.

CHAPTER CG9 – VIOLATIONS

CG9 – 01 GENERAL

BCC I.18.075 states what actions constitute civil violations of chapters BCC 24.06 and BCC 23.76, provides enforcement procedures for violations of these chapters and violations relating to illicit discharges, and specifies how penalties will be assessed.

CG9 – 02 ENFORCEMENT PROCESS

BCC I.18.075.E provides for an enforcement process with escalating enforcement actions for violations of the related codes and standards. For a first violation that does not result in an emergency, is not an illicit connection, or otherwise does not require issuance of a notice of violation, the city must attempt to secure voluntary correction from the responsible party. A request for voluntary compliance may be presented in the form of a written correction notice or a stop work order. These documents must include a description of the violation, a description of the corrective action required to bring the property into compliance, and a date by which the corrective action must be completed. The correction notice or stop work order must be personally served on the responsible person(s), posted conspicuously on the premises, or mailed to the responsible person(s) with delivery confirmation.

Enforcement for a repeat violation where the initial enforcement action was issuance of a correction notice may result in issuance of a stop work order, a voluntary correction agreement, or a notice of violation, depending on the severity of the violation. Posting of a stop work order requires that no further work be done on the property until the code violations have been corrected and the stop work order has been removed by the city. Issuance of a notice of violation will result in the responsible person(s) being scheduled to appear before the hearing examiner not less than 10 calendar days after the notice of civil violation is issued. The procedures for a hearing are provided in BCC I.18.050. Rules for the assessment of penalties are provided in BCC I.18.075.G.

APPENDIX A

CONSTRUCTION STORMWATER POLLUTION PREVENTION PLANNING

This appendix provides an overview of the important components of, and the process for, developing and implementing a Construction Stormwater Pollution Prevention Plan (CSWPPP), consistent with Chapter 3 of Volume II of the 2012 Washington State Department of Ecology Stormwater Management Manual for Western Washington, as amended in December 2014.

Section A.1 contains general guidelines with which site planners should become familiar. It describes criteria for plan format and content and ideas for improved plan effectiveness.

Section A.2 discusses the two main components of a CSWPPP, the narrative and the drawings.

Section A.3 outlines and describes a recommended step-by-step procedure for developing a Construction SWPPP from data collection to finished product. Step 3 in Section A.3 provides a description of each of the CSWPPP elements. This procedure is written in general terms to be applicable to all types of projects. Section A.3 also includes a checklist for developing a CSWPPP.

Design standards and specifications for Best Management Practices (BMPs) referred to in this appendix are found in Appendix B.

The CSWPPP may be a subset of the Stormwater Site Plan or construction plan set. Chapter 3, of Volume I, of the 2012 Washington State Department of Ecology Stormwater Management Manual for Western Washington, as amended in December 2014, discusses how to prepare a Stormwater Site Plan.

A. 1 General Guidelines

A.1.1 What is a Construction Stormwater Pollution Prevention Plan?

Construction Stormwater Pollution Prevention Plan (CSWPPP) means a written plan to implement measures to identify, prevent, and control the contamination of point source discharge of stormwater. The CSWPPP explains and illustrates the measures, usually in the form of best management practices (BMPs), to take on a construction site to control potential pollution problems.

A CSWPPP is required for projects meeting the Bellevue clearing & grading permit requirements.

While it is a good idea to include standards and specifications from the CSWPPP in the contract documents, the CSWPPP should be a separate document that can stand alone.

As site work progresses, the plan must be modified in prescribed time periods to reflect changing site conditions, subject to the rules for plan modification by the City.

A.1.2 Who is responsible for the CSWPPP?

The owner or lessee of the land being developed has the responsibility for CSWPPP preparation and submission to the City. The owner or lessee may designate someone (i.e., an engineer, architect, contractor, etc.) to prepare the CSWPPP, but the owner retains the ultimate responsibility for environmental protection at the site.

The CSWPPP must be located on the construction site or within reasonable access to the site for construction and inspection personnel, although a copy of the drawings must be kept on the construction site at all times.

A.1.3 What is an Adequate Plan?

The CSWPPP must contain sufficient information to satisfy the permitting authority (state, local, or both) that the problems of construction pollution have been adequately addressed for the proposed project.

An adequate CSWPPP includes a narrative and drawings. The narrative is a written statement to explain and justify the pollution prevention decisions made for a particular project. The narrative contains concise information about existing site conditions, construction schedules, and other pertinent items that are not contained on the drawings. The drawings show, on a site map, the specific BMPs which shall be installed. Provide text notes on the drawings to describe, the performance standards the BMPs should achieve, and actions to take if the performance goals are not achieved.

Reports summarizing the scope of inspections, the personnel conducting the inspection, the date(s) of the inspection, major observations relating to implementing the Construction SWPPP, and actions taken because of these inspections must be prepared and retained as part of the CSWPPP.

On construction sites that discharge to surface water, the primary concern in the preparation of the CSWPPP is compliance with Washington State Water Quality Standards.

On construction sites that infiltrate all stormwater runoff, the primary concern in the preparation of the CSWPPP is the protection of the infiltration facilities from fine sediments during the construction phase and protection of ground water from other pollutants. Several of the other elements are very important at these sites as well, such as marking the clearing limits, establishing the construction access, and managing the project.

Whether the stormwater discharges to surface water or completely infiltrates, each of the 13 elements must be included in the CSWPPP unless an element is determined not to be applicable to the project and the exemption is justified in the narrative.

The step-by-step procedure outlined in Section 3.3 of this volume is recommended for the development of the CSWPPPs. The checklist in Section 3.3 may be helpful in preparing the CSWPPP.

A.1.4 BMP Standards and Specifications

BMPs refer to schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control:

- Stormwater associated with construction activity.
- Ground water associated with construction activity.
- Spillage or leaks.
- Sludge or waste disposal.
- Drainage from raw material storage.

Chapter 4 contains standards and specifications for the BMPs commonly used in Construction SWPPPs to address the 13 elements. BMPs can be used singularly or in combination. If a CSWPPP makes use of a BMP, the narrative and drawings must clearly reference the specific BMP title and number.

The standards and specifications in Chapter 4 are not intended to limit any innovative or creative effort to effectively control erosion and sedimentation. CSWPPPs can contain experimental BMPs or make minor modifications to standard BMPs. However, the City must approve such practices before use. All experimental BMPs and modified BMPs must achieve the same or better performance than the BMPs listed in Chapter 4.

CSWPPPs can also contain BMPs from other guidance documents or manuals which Ecology has approved as providing an equivalent level of pollution prevention.

If a CSWPPP uses an experimental, modified, or approved equivalent BMP, then the CSWPPP must contain the following:

1. The technical basis for the selection of the experimental, modified, or approved equivalent BMP (scientific, technical studies, and/or modeling) that support the performance claims for the BMP.
2. An assessment of how the experimental, modified, or approved equivalent BMP will satisfy all known, available, and reasonable methods of prevention, control and treatment (AKART) requirements and the applicable federal technology-based treatment requirements under 40 Code of Federal Regulations (CFR) part 125.3.

A.1.5 General Principles

The CSWGP (Construction Stormwater General Permit) outlines numerous specific requirements related to elements 1 through 12 that the CSWPPP must address. The SWMMWW and the Municipal Stormwater General Permits include element number 13 which applies to new and redevelopment construction projects. The CSWGP does not contain element number 13. All permittees should be familiar with the requirements in their permits.

A.2 CSWPPP Requirements

The CSWPPP consists of two parts: a narrative and the drawings. Both parts shall contain information specific to the construction site. Not all items listed below are applicable to all construction projects. The author of the CSWPPP should ensure that the applicable sections are addressed. The following two sections describe the contents of the narrative and the drawings. A checklist is included in Section 3.3 of this volume as a quick reference to determine if all the major items are included in the CSWPPP.

A.2.1 Narrative

The author of the CSWPPP should evaluate the following subject areas for inclusion in the Construction SWPPP narrative. The subject areas below are not an outline for the Construction SWPPP narrative.

- General Information on the Existing Site and Project
 - Project description: Describe the nature and purpose of the construction project. Include the total size of the area, any increase in existing impervious area; the total area expected to be disturbed by clearing, grading, excavation or other construction activities, including off-site borrow and fill areas; and the volumes of grading cut and fill that are proposed.
 - Existing site conditions: Describe the existing topography, vegetation, and drainage. Include a description of any structures or development on the parcel including the area of existing impervious surfaces.
 - Adjacent areas: Describe adjacent areas, including streams, lakes, wetlands, residential areas, and roads that might be affected by the construction project. Describe how upstream drainage areas may affect the site. Provide a description of the upstream drainage leading to the site and the downstream drainage leading from the site to the receiving body of water.
 - Critical areas: Describe areas on or adjacent to the site that are classified as critical areas. Critical areas that receive runoff from the site shall be described up to ¼ mile away. The City may increase the distance. Describe special requirements for working near or within these areas.
 - Soil: Describe the soil on the site, giving such information as soil names, mapping unit, erodibility, settleability, permeability, depth, depth to ground water, texture, and soil structure.
 - Potential erosion problem areas: Describe areas on the site that have potential erosion problems.
- Thirteen (13) elements: Describe how the CSWPPP addresses each of the 12 required elements. Include the type and location of BMPs used to satisfy the required element. Often using a combination of BMPs is the best way to satisfy required elements. If an element is not applicable to a project, provide a written justification for why it is not necessary.
- Construction Schedule and phasing: Describe the construction schedule. If the schedule extends into the wet season, describe what activities will continue during the wet season and how the transport of sediment from the construction site to receiving waters will be prevented. Describe the intended sequence and timing of construction activities and any proposed construction phasing.

- Financial/ownership responsibilities: Describe ownership and obligations for the project. Include bond forms and other evidence of financial responsibility for environmental liabilities associated with construction.
- Engineering calculations: Attach any calculations made for the design of such items as sediment ponds, diversions, and waterways, as well as calculations for runoff and stormwater detention design (if applicable). Engineering calculations must bear the signature and stamp of an engineer licensed in the state of Washington.
- Certified Erosion and Sediment Control Lead (CESCL): Identify along with their contact information and expiration of their CESCL certification.

A 2.2 Drawings

- Vicinity map: Provide a map with enough detail to identify the location of the construction site, adjacent roads, and receiving waters.
- Site map: Provide a site map(s) showing the features numbered below. The site map requirements may be met using multiple plan sheets for ease of legibility.
 1. A legal description of the property boundaries or an illustration of property lines (including distances) in the drawings.
 2. The direction of north in relation to the site.
 3. Existing structures and roads, if present.
 4. The boundaries of and labels indicating different soil types.
 5. Areas of potential erosion problems.
 6. Any on-site and adjacent surface waters, critical areas, their buffers, FEMA base flood boundaries, and Shoreline Management boundaries.
 7. Existing contours and drainage basins and the direction of flow for the different drainage areas.
 8. Final and interim grade contours as appropriate, drainage basins, and the direction of stormwater flow during and upon completion of construction.
 9. Areas of soil disturbance, including all areas affected by clearing, grading and excavation.
 10. Locations where stormwater discharges to surface waters during and upon completion of construction.
 11. Existing unique or valuable vegetation and the vegetation that is to be preserved.
 12. Cut and fill slopes indicating top and bottom of slope catch lines.
 13. Stockpile, waste storage, and vehicle storage/maintenance areas.
 14. Total cut and fill quantities and the method of disposal for excess material.

- Conveyance systems: Show on the site map the following temporary and permanent conveyance features:
 1. Locations for temporary and permanent swales, interceptor trenches, or ditches.
 2. Drainage pipes, ditches, or cut-off trenches associated with erosion and sediment control and stormwater management.
 3. Temporary and permanent pipe inverts and minimum slopes and cover.
 4. Grades, dimensions, and direction of flow in all ditches and swales, culverts, and pipes.
 5. Details for bypassing off-site runoff around disturbed areas.
 6. Locations and outlets of any dewatering systems.
- Location of detention BMPs: Show on the site map the locations of stormwater detention BMPs.
- Erosion and Sediment Control (ESC) BMPs: Show on the site map all major structural and nonstructural ESC BMPs including:
 1. The location of sediment pond(s), pipes and structures.
 2. Dimension pond berm widths and inside and outside pond slopes.
 3. The trap/pond storage required and the depth, length, and width dimensions.
 4. Typical section views through pond and outlet structure.
 5. Typical details of gravel cone and standpipe, and/or other filtering devices.
 6. Stabilization technique details for inlets and outlets.
 7. Control/restrictor device location and details.
 8. Stabilization practices for berms, slopes, and disturbed areas.
 9. Rock specifications and detail for rock check dam, if used.
 10. Spacing for rock check dams as required.
 11. Front and side sections of typical rock check dams.
 12. The location, detail, and specification for silt fence.
 13. The construction entrance location and a detail.
- Detailed drawings: Any structural source control practices used that are not referenced in this manual or other local manuals must be explained and illustrated with detailed drawings.
- Other pollutant BMPs: Indicate on the site map the location of BMPs to be used for the control of pollutants other than sediment such as high or low pH and hydrocarbons.
- Monitoring locations: Indicate on the site map the water quality sampling locations, if required by the City or the Department of Ecology. Sampling stations must be located in accordance with applicable permit requirements.
- Standard notes are suggested in Appendix B. Notes addressing construction phasing and scheduling must be included on the drawings.

A. 3 Step-By-Step Procedure

There are three basic steps in producing a CSWPPP:

Step 1 - Data Collection

Step 2 - Data Analysis

Step 3 - CSWPPP Development and Implementation

A CSWPPP is required for projects meeting the requirements in Section 23.76.035 of the clearing & grading code. The City of Bellevue will allow small construction projects to prepare a simpler CSWPPP,

consisting of a short form and drawings. Permittees should check with Bellevue's clearing and grading section about requirements related to construction stormwater.

A.3.1 Step 1 - Data Collection

Evaluate existing site conditions and gather information that will help develop the most effective CSWPPP. The Construction SWPPP author may use the information collected during the development of the Stormwater Site Plan to augment the information discussed below.

Topography: Prepare a topographic drawing of the site to show the existing contour elevations at intervals of 1 to 5 feet depending upon the slope of the terrain.

Drainage: Locate and clearly mark existing drainage swales and patterns on the drawing, including existing storm drain pipe systems.

Soils: Identify and label soil type(s) and erodibility (low, medium, high or an index value) on the drawing or in the narrative.

Characterize soils for permeability, percent organic matter, and effective depth. Express these qualities in averaged or nominal terms for the subject site or project. This information is frequently available in published literature by qualified soil professionals or engineers.

For example, the 1983 Soil Survey of Snohomish County lists the following information for each soil mapping unit or designation (e.g., a Sultan silt loam):

- A sieve analysis of the soils
- Permeability (in/hr)
- Available water-holding capacity (in/in)
- The percent of organic matter

Soils information can be obtained from a Natural Resource Conservation Service (NRCS) manual (if one has been published for the county where the construction project is located) or the NRCS' Web Soil Survey website at <http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>. If a soil survey is not available, make a request to a District NRCS. Additionally, soil data can be obtained through site soil analysis as a part of preparation of a Stormwater Site Plan (See Volume I, Chapter 3 of the SWMMWW).

Ground Cover: Label existing vegetation on the drawing. Show features such as tree clusters, grassy areas, and unique or sensitive vegetation. Unique vegetation may include existing trees above a given diameter. Investigate local requirements regarding tree preservation. Indicate existing denuded or exposed soil areas.

Critical Areas: Delineate critical areas adjacent to or within the site on the drawing. Show features such as steep slopes, streams, floodplains, lakes, wetlands, sole source aquifers, and geologic hazard areas. Delineate setbacks and buffer limits for these features on the drawings. On the drawings, show other related jurisdictional boundaries such as Shorelines Management and the Federal Emergency Management Agency (FEMA) base floodplain.

Adjacent Areas: Identify existing buildings, roads, and facilities adjacent to or within the project site on the drawings. Identify existing and proposed utility locations, construction clearing limits and erosion and sediment control BMPs on the drawings.

Existing Encumbrances: Identify wells, existing and abandoned septic drain field, utilities, easements, setbacks, and site constraints.

Precipitation Records: Determine the average monthly rainfall and rainfall intensity for the required design storm events. These records may be available from the City. Volume III of the SWMMWW also has resources for determining rainfall values.

A.3.2 Step 2 - Data Analysis

Consider the data collected in Step 1 to visualize potential problems and limitations of the site. Determine those areas that have critical erosion hazards. The following are some important factors to consider in data analysis:

Topography: The primary topographic considerations are slope steepness and slope length. Steeper and longer slopes have greater erosion potential than do flat and short slopes. A qualified engineer, soil professional, or certified erosion control specialist should determine erosion potential.

Drainage: Convey runoff through the use of natural drainage patterns that consist of overland flow, swales and depressions to avoid constructing an artificial drainage system. Properly stabilize man-made ditches and waterways so they do not create erosion problems. Take care to ensure that increased runoff from the site will not erode or flood the existing natural drainage system. Consider possible sites for temporary stormwater retention and detention.

Direct construction away from areas of saturated soil where ground water may be encountered and away from critical areas where drainage will concentrate. Preserve natural drainage patterns on the site.

Soils: Evaluate soil properties such as surface and subsurface runoff characteristics, depth to impermeable layer, depth to seasonal ground water table, permeability, shrink-swell potential, texture, settleability, and erodibility. Develop the CSWPPP based on known soil characteristics. Protect Infiltration sites from clay and silt which will reduce infiltration capacities.

Ground Cover: Ground cover is the most important factor in terms of preventing erosion. Existing vegetation that can be saved will prevent erosion better than constructed BMPs. Trees and other vegetation protect the soil structure. If the existing vegetation cannot be saved, consider such practices as phasing construction, temporary seeding, and mulching. Phasing of construction involves stabilizing one part of the site before disturbing another. In this way, the entire site is not disturbed at once.

Critical Areas: Critical areas may include flood hazard areas, mine hazard areas, slide hazard areas, sole source aquifers, wetlands, streambanks, fish-bearing streams, and other water bodies. Any critical areas within or adjacent to the development should exert a strong influence on land development decisions. Delineate critical areas and their buffers on the drawings and clearly flag critical areas in the

field. For example, chain link fencing may be more useful than flagging to assure that equipment operators stay out of critical areas. Only unavoidable work should take place within critical areas and their buffers. Such unavoidable work will require special BMPs, permit restrictions, and mitigation plans-documented routinely in the CSWPPP.

Adjacent Areas: An analysis of adjacent properties should focus on areas upslope and downslope from the construction project. Water bodies that will receive direct runoff from the site are a major concern. Evaluate the types, values, and sensitivities of and risks to downstream resources, such as private property, stormwater facilities, public infrastructure, or aquatic systems. Select erosion and sediment controls accordingly.

Precipitation Records: Refer to Volume III of the SWMMWW to determine the required rainfall records and the method of analysis for design of BMPs.

Timing of the Project: Consider the timing and duration of the project when selecting BMPs. Projects that will proceed during the wet season and projects that will last through several seasons must take all necessary precautions to remain in compliance with the water quality standards.

A.3.3 Step 3 - CSWPPP Development and Implementation

After collecting and analyzing the data to determine the site limitations, the planner can then develop a CSWPPP. Each of the 13 elements below must be considered and included in the CSWPPP unless site conditions render the element unnecessary and the exemption from that element is clearly justified in the narrative of the CSWPPP.

Element #1: Preserve Vegetation/Mark Clearing Limits

Construction Stormwater General Permit and Municipal Stormwater Permits Requirements

- Before beginning land disturbing activities, including clearing and grading, clearly mark all clearing limits, sensitive areas and their buffers, and trees that are to be preserved within the construction area.
- Retain the duff layer, native top soil, and natural vegetation in an undisturbed state to the maximum extent practicable.

Additional Guidance

- Plastic, metal, or fabric fence may be used to mark the clearing limits. [Note: the difference between the practical use and proper installation of silt fencing and the proper use of clearing boundary fencing.]
- If it is not practical to retain the duff layer in place, then stockpile it on-site, cover it to prevent erosion, and replace it immediately when you finish disturbing the site.

Suggested BMPs

- BMP C101: Preserving Natural Vegetation
- BMP C102: Buffer Zones
- BMP C103: High Visibility Plastic or Metal Fence
- BMP C233: Silt Fence

Element #2: Establish Construction Access

Construction Stormwater General Permit and Municipal Stormwater Permits Requirements

- Limit construction vehicle access and exit to one route, if possible.
- Stabilize access points with a pad of quarry spalls, crushed rock, or other equivalent BMPs, to minimize the tracking of sediment onto roads.
- Locate wheel wash or tire baths on site, if stabilized construction entrance is not effective in preventing tracking sediment onto roads.
- If sediment is tracked off site, clean the affected roadway thoroughly at the end of each day, or more frequently as necessary (for example, during wet weather). Remove sediment from roads by shoveling, sweeping, or pickup and transport the sediment to a controlled sediment disposal area.
- Conduct street washing only after sediment is removed in accordance with the above bullet.
- Control street wash wastewater by pumping back on site or otherwise preventing it from discharging into systems tributary to waters of the State.

Additional Guidance

- Minimize construction site access point along linear projects, such as roadways. Street washing may require City approval.

Suggested BMPs

- BMP C105: Stabilized Construction Entrance/Exit
- BMP C106: Wheel Wash
- BMP C107: Construction Road/Parking Area Stabilization

Element #3: Control Flow Rates

Construction Stormwater General Permit and Municipal Stormwater Permits Requirements

- Protect properties and waterways downstream of development sites from erosion and the associated discharge of turbid waters due to increases in the velocity and peak volumetric flow rate of stormwater runoff from the project site, as required by City plan approval authority.
- Where necessary to comply with the bullet above, construct stormwater retention or detention facilities as one of the first steps in grading. Assure that detention facilities function properly before constructing site improvements (e.g. impervious surfaces)
- If permanent infiltration ponds are used for flow control during construction, these facilities should be protected from siltation during the construction phase.

Additional Guidance

- Conduct downstream analysis if changes in off-site flows could impair or alter conveyance systems, streambanks, bed sediment, or aquatic habitat. See Volume I, Chapter 3 of the SWMMWW for offsite analysis guidelines.
- Even gently sloped areas need flow controls such as straw wattles or other energy dissipation / filtration structures. Place dissipation facilities closer together on steeper slopes. These

methods prevent water from building higher velocities as it flows downstream within the construction site.

- Outlet structures designed for permanent detention ponds are not appropriate for use during construction without modification. If used during construction, install an outlet structure that will allow for long-term storage of runoff and enable sediment to settle. Verify that the pond is sized appropriately for this purpose. Restore ponds to their original design dimensions, remove sediment, and install a final outlet structure at completion of the project.
- Erosion has the potential to occur because of increases in the volume, velocity, and peak flow rate of stormwater runoff from the project site. The local permitting agency may require pond designs that provide additional or different stormwater flow control. These requirements may be necessary to address local conditions or to protect properties and waterways downstream.
- Sites that must implement flow control for the developed site condition must also control stormwater release rates during construction. Construction site stormwater discharges shall not exceed the discharge durations of the pre-developed condition for the range of predeveloped discharge rates from ½ of the 2-year flow through the 10-year flow as predicted by an approved continuous runoff model. The pre-developed condition to be matched shall be the land cover condition immediately prior to the development project. This restriction on release rates can affect the size of the storage pond and treatment cells.

Suggested BMPs

- BMP C203: Water Bars
- BMP C207: Check Dams
- BMP C209: Outlet Protection
- BMP C235: Wattles
- BMP C240: Sediment Trap
- BMP C241: Temporary Sediment Pond
- Refer to Volume 3 of the SWMMWW, Detention Facilities, Infiltration Stormwater Quantity and Flow Control

Element #4: Install Sediment Controls

Construction Stormwater General Permit and Municipal Stormwater Permits Requirements

The Permittee must design, install and maintain effective erosion controls and sediment controls to minimize the discharge of pollutants. At a minimum, the Permittee must design, install and maintain such controls to:

- Construct sediment control BMPs (sediment ponds, traps, filters, etc.) as one of the first steps in grading. These BMPs shall be functional before other land disturbing activities take place.
- Minimize sediment discharges from the site. The design, installation and maintenance of erosion and sediment controls must address factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting stormwater runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site.
- Direct stormwater runoff from disturbed areas through a sediment pond or other appropriate sediment removal BMP, before the runoff leaves a construction site or before discharge to an

infiltration facility. Runoff from fully stabilized areas may be discharged without a sediment removal BMP, but must meet the flow control performance standard in Element #3, bullet #1.

- Locate BMPs intended to trap sediment on site in a manner to avoid interference with the movement of juvenile salmonids attempting to enter off-channel areas or drainages.
- Provide and maintain natural buffers around surface waters, direct stormwater to vegetated areas to increase sediment removal, and maximize stormwater infiltration, unless infeasible.
- Where feasible, design outlet structures that withdraw impounded stormwater from the surface to avoid discharging sediment that is still suspended lower in the water column.

Additional Guidance

- Outlet structures that withdraw impounded stormwater from the surface to avoid discharging sediment that is still suspended lower in the water column are for the construction period only. If the pond using the construction outlet control is used for permanent stormwater controls, the appropriate outlet structure must be installed after the soil disturbance has ended
- Seed and mulch earthen structures such as dams, dikes, and diversions per the timing indicated in Element #5.
- Full stabilization includes concrete or asphalt paving; quarry spalls used as ditch lining; or the use of rolled erosion products, a bonded fiber matrix product, or vegetative cover in a manner that will fully prevent soil erosion.
- The City may inspect and approve areas fully stabilized by means other than pavement or quarry spalls.
- If installing a floating pump structure, include a stopper to prevent the pump basket from hitting the bottom of the pond.

Suggested BMPs

- BMP C231: Brush Barrier
- BMP C232: Gravel Filter Berm
- BMP C233: Silt Fence
- BMP C234: Vegetated Strip
- BMP C235: Wattles
- BMP C240: Sediment Trap
- BMP C241: Temporary Sediment Pond
- BMP C250: Construction Stormwater Chemical Treatment
- BMP C251: Construction Stormwater Filtration

Element #5: Stabilize Soils

Construction Stormwater General Permit and Municipal Stormwater Permits Requirements

- Stabilize exposed and unworked soils by application of effective BMPs that prevent erosion. Applicable BMPs include, but are not limited to: temporary and permanent seeding, sodding, mulching, plastic covering, erosion control fabrics and matting, soil application of polyacrylamide (PAM), the early application of gravel base early on areas to be paved, and dust control.
- Control stormwater volume and velocity within the site to minimize soil erosion.

- Control stormwater discharges, including both peak flow rates and total stormwater volume, to minimize erosion at outlets and to minimize downstream channel and stream bank erosion.
- Soils must not remain exposed and unworked for more than the time periods set forth below to prevent erosion.
- During the dry season (May 1 - Sept. 30): 7 days.
- During the wet season (October 1 - April 30): 2 days.
- Stabilize soils at the end of the shift before a holiday or weekend if needed based on the weather forecast.
- Stabilize soil stockpiles from erosion, protect with sediment trapping measures, and where possible, be located away from storm drain inlets, waterways, and drainage channels.
- Minimize the amount of soil exposed during construction activity.
- Minimize the disturbance of steep slopes.
- Minimize soil compaction and, unless infeasible, preserve topsoil.

Additional Guidance

- Soils must not remain exposed and unworked for more than the time periods set forth above to prevent erosion for linear projects.
- Soil stabilization measures should be appropriate for the time of year, site conditions, estimated duration of use, and potential water quality impacts that stabilization agents may have on downstream waters or ground water.
- Ensure that gravel base used for stabilization is clean and does not contain fines or sediment.

Suggested BMPs

- BMP C120: Temporary and Permanent Seeding
- BMP C121: Mulching
- BMP C122: Nets and Blankets
- BMP C123: Plastic Covering
- BMP C124: Sodding
- BMP C125: Topsoiling/Composting
- BMP C126: Polyacrylamide for Soil Erosion Protection
- BMP C130: Surface Roughening
- BMP C131: Gradient Terraces
- BMP C140: Dust Control

Element #6: Protect Slopes

Construction Stormwater General Permit and Municipal Stormwater Permits Requirements

- Design and construct cut and fill slopes in a manner that will minimize erosion. Applicable practices include, but are not limited to, reducing continuous length of slope with terracing and diversions, reducing slope steepness, and roughening slope surfaces (for example, track walking).
- Divert off-site stormwater (run-on) or ground water away from slopes and disturbed areas with interceptor dikes, pipes, and/or swales. Off-site stormwater should be managed separately from stormwater generated on the site.

- At the top of slopes, collect drainage in pipe slope drains or protected channels to prevent erosion.
 - Temporary pipe slope drains shall handle the peak volumetric flow rate calculated using a 10-minute time step from a Type 1A, 10 year, 24-hour frequency storm for the developed condition. Alternatively, the 10-year, 1-hour flow rate predicted by an approved continuous runoff model, increased by a factor of 1.6, may be used. The hydrologic analysis must use the existing land cover condition for predicting flow rates from tributary areas outside the project limits. For tributary areas on the project site, the analysis must use the temporary or permanent project land cover condition, whichever will produce the highest flow rates. If using the Western Washington Hydrology Model (WWHM) to predict flows, bare soil areas should be modeled as "landscaped" area.
- Place excavated material on the uphill side of trenches, consistent with safety and space considerations.
- Place check dams at regular intervals within channels that are cut down a slope.

Additional Guidance

- Where 15-minute time steps are available in an approved continuous runoff model, they may be used directly without a correction factor.
- Consider soil type and its potential for erosion.
- Stabilize soils on slopes, as specified in Element #5.
- BMP combinations are the most effective method of protecting slopes with disturbed soils. For example, use both mulching and straw erosion control blankets in combination.

Suggested BMPs

- BMP C120: Temporary and Permanent Seeding
- BMP C121: Mulching
- BMP C122: Nets and Blankets
- BMP C123: Plastic Covering
- BMP C124: Sodding
- BMP C130: Surface Roughening
- BMP C131: Gradient Terraces
- BMP C200: Interceptor Dike and Swale
- BMP C201: Grass-Lined Channels
- BMP C203: Water Bars
- BMP C204: Pipe Slope Drains
- BMP C205: Subsurface Drains
- BMP C206: Level Spreader
- BMP C207: Check Dams
- BMP C208: Triangular Silt Dike (Geotextile-Encased Check Dam)

Element #7: Protect Drain Inlets

Construction Stormwater General Permit and Municipal Stormwater Permits Requirements

- Protect all storm drain inlets made operable during construction so that stormwater runoff does not enter the conveyance system without first being filtered or treated to remove sediment.
- Keep all approach roads clean. Do not allow sediment and street wash water to enter storm drains without prior and adequate treatment unless treatment is provided before the storm drain discharges to waters of the State.
- Inlets should be inspected weekly at a minimum and daily during storm events.

Suggested BMPs

- BMP C220: Storm Drain Inlet Protection

Element #8: Stabilize Channels and Outlets

Construction Stormwater General Permit and Municipal Stormwater Permits Requirements

- Design, construct, and stabilize all on-site conveyance channels to prevent erosion from the following expected peak flows:
 - Channels must handle the peak volumetric flow rate calculated using a 10-minute time step from a Type 1A, 10-year, 24-hour frequency storm for the developed condition. Alternatively, the 10-year, 1-hour flow rate indicated by an approved continuous runoff model, increased by a factor of 1.6, may be used. The hydrologic analysis must use the existing land cover condition for predicting flow rates from tributary areas outside the project limits. For tributary areas on the project site, the analysis must use the temporary or permanent project land cover condition, whichever will produce the highest flow rates. If using the Western Washington Hydrology Model (WWHM) to predict flows, bare soil areas should be modeled as "landscaped area."
- Provide stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent streambanks, slopes, and downstream reaches at the outlets of all conveyance systems.

Additional Guidance

The best method for stabilizing channels is to completely line the channel with a blanket product first, then add check dams as necessary to function as an anchor and to slow the flow of water.

Suggested BMPs

- BMP C202: Channel Lining
- BMP C122: Nets and Blankets
- BMP C207: Check Dams
- BMP C209: Outlet Protection

Element #9: Control Pollutants

Construction Stormwater General Permit and Municipal Stormwater Permits Requirements

- Design, install, implement and maintain effective pollution prevention measures to minimize the discharge of pollutants
- Handle and dispose of all pollutants, including waste materials and demolition debris that occur onsite in a manner that does not cause contamination of stormwater.
- Provide cover, containment, and protection from vandalism for all chemicals, liquid products, petroleum products, and other materials that have the potential to pose a threat to human health or the environment. On-site fueling tanks shall include secondary containment. Secondary containment means placing tanks or containers within an impervious structure capable of containing 110% of the volume contained in the largest tank within the containment structure. Double-walled tanks do not require additional secondary containment.
- Conduct maintenance, fueling, and repair of heavy equipment and vehicles using spill prevention, and control measures. Clean contaminated surfaces immediately following any spill incident.
- Discharge wheel wash or tire bath wastewater to a separate on-site treatment system that prevents discharge to surface water, such as closed-loop recirculation or upland land application, or to the sanitary sewer with City of Bellevue and King County approval.
- Apply fertilizers and pesticides in a manner and at application rates that will not result in loss of chemical to stormwater runoff. Follow manufacturers' label requirements for application rates and procedures.
- Use BMPs to prevent contamination of stormwater runoff by pH modifying sources. The sources for this contamination include, but are not limited to: bulk cement, cement kiln dust, fly ash, new concrete washing and curing waters, waste streams generated from concrete grinding and sawing, exposed aggregate processes, dewatering concrete vaults, concrete pumping and mixer washout waters.
- Adjust the pH of stormwater if necessary to prevent violations of water quality standards.
- Assure that washout of concrete trucks is performed off-site or in designated concrete washout areas only. Do not wash out concrete trucks onto the ground, or into storm drains, open ditches, streets, or streams. Do not dump excess concrete on site, except in designated concrete washout areas. Concrete spillage or concrete discharge to surface waters of the State is prohibited.
- Obtain written approval from Ecology before using chemical treatment other than CO₂ or dry ice to adjust pH.

Additional Guidance

- Wheel wash or tire bath wastewater should not include wastewater from concrete washout areas.
- Do not use upland land applications for discharging wastewater from concrete washout areas.
- Woody debris may be chopped and spread on site.
- Conduct oil changes, hydraulic system drain down, solvent and de-greasing cleaning operations, fuel tank drain down and removal, and other activities which may result in discharge or spillage of pollutants to the ground or into stormwater runoff using spill prevention measures, such as drip pans.

- Clean contaminated surfaces immediately following any discharge or spill incident. Emergency repairs may be performed on-site using temporary plastic placed beneath and, if raining, over the vehicle.

Suggested BMPs

- BMP C151: Concrete Handling
- BMP C152: Sawcutting and Surfacing Pollution Prevention
- BMP C153: Material Delivery, Storage and Containment
- BMP C154: Concrete Washout Area
- BMP C250: Construction Stormwater Chemical Treatment
- BMP C251: Construction Stormwater Filtration
- BMP C252: High pH Neutralization Using CO₂
- BMP C253: pH Control for High pH Water
- See SMMWW, Volume IV – Source Control BMPs

Element #10: Control De-Watering

Construction Stormwater General Permit and Municipal Stormwater Permits Requirements

- Discharge foundation, vault, and trench de-watering water, which have similar characteristics to stormwater runoff at the site, into a controlled conveyance system before discharge to a sediment trap or sediment pond.
- Discharge clean, non-turbid de-watering water, such as well-point ground water, to systems tributary to, or directly into state surface waters, as specified in Element #8, provided the de-watering flow does not cause erosion or flooding of receiving waters or interfere with the operation of the system. Do not route clean dewatering water through stormwater sediment ponds. Note that “surface waters of the State” may exist on a construction site as well as off site; for example, a creek running through a site.
- Handle highly turbid or contaminated dewatering water separately from stormwater.
- Other disposal options may include:
 1. Infiltration
 2. Transport offsite in a vehicle, such as a vacuum flush truck, for legal disposal in a manner that does not pollute state waters,
 3. Ecology-approved on-site chemical treatment or other suitable treatment technologies,
 4. Sanitary sewer discharge with City of Bellevue and Metro approval, if there is no other option.
 5. Use of a sedimentation bag with outfall to a ditch or swale for small volumes of localized dewatering.

Additional Guidance

- Channels must be stabilized, as specified in Element #8.
- Construction equipment operation, clamshell digging, concrete tremie pour, or work inside a cofferdam can create highly turbid or contaminated dewatering water.
- Discharging sediment-laden (muddy) water into waters of the State likely constitutes violation of water quality standards for turbidity. The easiest way to avoid discharging muddy water is through infiltration and preserving vegetation.

Suggested BMPs

- BMP C203: Water Bars
- BMP C236: Vegetative Filtration

Element #11: Maintain BMPs

Construction Stormwater General Permit and Municipal Stormwater Permits Requirements

- Maintain and repair all temporary and permanent erosion and sediment control BMPs as needed to assure continued performance of their intended function in accordance with BMP specifications.
- Remove all temporary erosion and sediment control BMPs within 30 days after achieving final site stabilization or after the temporary BMPs are no longer needed.

Additional Guidance

- Note: Some temporary erosion and sediment control BMPs are bio- degradable and designed to remain in place following construction such as compost socks
- Provide protection to all BMPs installed for the permanent control of stormwater from sediment and compaction. All BMPs that are to remain in place following completion of construction shall be examined and placed in full operating conditions. If sediment enters the BMPs during construction, it shall be removed and the facility shall be returned to the conditions specified in the construction documents.
- Remove or stabilize trapped sediment on site. Permanently stabilize disturbed soil resulting from removal of BMPs or vegetation.

Suggested BMPs

- BMP C150: Materials on Hand
- BMP C160: Certified Erosion and Sediment Control Lead

Element #12: Manage the Project

Construction Stormwater General Permit and Municipal Stormwater Permit Requirements

- Phase development projects to the maximum degree practicable and consider seasonal work limits.
- Inspection and monitoring – Inspect, maintain, and repair all BMPs as needed to assure continued performance of their intended function. Conduct site inspections and monitoring in accordance with the Construction Stormwater General Permit or local plan approval authority.
- Maintaining an updated construction SWPPP – Maintain, update, and implement the SWPPP in accordance with the Construction Stormwater General Permit.

Municipal Stormwater Permit Requirements

- Projects that disturb one or more acres must have, site inspections conducted by a Certified Erosion and Sediment Control Lead (CESCL). Project sites less than one acre (not part of a larger common plan of development or sale) may have a person without CESCL certification conduct inspections. By the initiation of construction, the SWPPP must identify the CESCL or inspector, who shall be present on-site or on-call at all times.

Additional Guidance for Site Inspections

- The CESCL or inspector (project sites less than one acre) must have the skills to assess the:
 - Site conditions and construction activities that could impact the quality of stormwater.
 - Effectiveness of erosion and sediment control measures used to control the quality of stormwater discharges.
- The CESCL or inspector must examine stormwater visually for the presence of suspended sediment, turbidity, discoloration, and oil sheen. They must evaluate the effectiveness of BMPs and determine if it is necessary to install, maintain, or repair BMPs to improve the quality of stormwater discharges.
- Based on the results of the inspection, construction site operators must correct the problems identified by:
 - Reviewing the SWPPP for compliance with the 13 construction SWPPP elements and making appropriate revisions within 7 days of the inspection.
 - Immediately beginning the process of fully implementing and maintaining appropriate source control and/or treatment BMPs as soon as possible, addressing the problems no later than within 10 days of the inspection. If installation of necessary treatment BMPs is not feasible within 10 days, the construction site operator may request an extension within the initial 10-day response period.
- Documenting BMP implementation and maintenance in the site log book (applies only to sites that have coverage under the Construction Stormwater General Permit).
- The CESCL or inspector must inspect all areas disturbed by construction activities, all BMPs, and all stormwater discharge points at least once every calendar week and within 24 hours of any discharge from the site. (For purposes of this condition, individual discharge events that last more than one day do not require daily inspections. For example, if a stormwater pond discharges continuously over the course of a week, only one inspection is required that week.) The CESCL or inspector may reduce the inspection frequency for temporary stabilized, inactive sites to once every calendar month.

Additional Guidance

Phasing of Construction

- Phase development projects where feasible to prevent soil erosion and, to the maximum extent practical, and prevent transporting sediment from the site during construction. Revegetate exposed areas and maintain that vegetation as an integral part of the clearing activities for any phase.
- Clearing and grading activities for developments shall be permitted only if conducted using an approved site development plan (e.g., subdivision approval) that establishes permitted areas of clearing, grading, cutting, and filling. Minimize removing trees and disturbing or compacting native soils when establishing permitted clearing and grading areas. Show on the site plans and the development site permitted clearing and grading areas and any other areas required to preserve critical or sensitive areas, buffers, native growth protection easements, or tree retention areas as may be required by local jurisdictions.

Seasonal Work Limitations

- From October 1 through April 30, clearing, grading, and other soil disturbing activities is permitted only if shown to the satisfaction of the City that the site operator will prevent silt-laden runoff from leaving the site through a combination of the following:
 1. Site conditions including existing vegetative coverage, slope, soil type, and proximity to receiving waters.
 2. Limit activities and the extent of disturbed areas.
 3. Proposed erosion and sediment control measures.
- Based on the information provided and/or local weather conditions, the City may expand or restrict the seasonal limitation on site disturbance. The City has the authority to take enforcement action –such as a notice of violation, administrative order, penalty, or stop-work order under the following circumstances:
 - If, during the course of any construction activity or soil disturbance during the seasonal limitation period, sediment leaves the construction site causing a violation of the surface water quality standard; or
 - If clearing and grading limits or erosion and sediment control measures shown in the approved plan are not maintained.

The following activities are exempt from the seasonal clearing and grading limitations:

1. Routine maintenance and necessary repair of erosion and sediment control BMPs;
2. Routine maintenance of public facilities or existing utility structures that do not expose the soil or result in the removal of the vegetative cover to soil.
3. Activities where there is one hundred percent infiltration of surface water runoff within the site in approved and installed erosion and sediment control facilities.

Coordination with Utilities and Other Contractors

The primary project proponent shall evaluate, with input from utilities and other contractors, the stormwater management requirements for the entire project, including the utilities, when preparing the Construction SWPPP.

Inspection and Monitoring

All BMPs must be inspected, maintained, and repaired as needed to assure continued performance of their intended function. Site inspections must be conducted by a person knowledgeable in the principles and practices of erosion and sediment control. The person must have the skills to 1) assess the site conditions and construction activities that could impact the quality of stormwater, and 2) assess the effectiveness of erosion and sediment control measures used to control the quality of stormwater discharges.

For construction sites one acre or larger that discharge stormwater to surface waters of the state, a CESCL must be identified in the construction SWPPP; this person must be on-site or on-call at all times. Certification must be obtained through an approved training program that meets the erosion and sediment control training standards established by Ecology.

Appropriate BMPs or design changes shall be implemented as soon as possible whenever inspection and/or monitoring reveals that the BMPs identified in the Construction SWPPP are inadequate, due to the actual discharge of /or potential to discharge a significant amount of any pollutant.

- Maintaining an Updated Construction SWPPP

Retain the Construction SWPPP on-site or within reasonable access to the site.

Modify the SWPPP whenever there is a change in the design, construction, operation, or maintenance at the construction site that has, or could have, a significant effect on the discharge of pollutants to waters of the state.

The SWPPP must be modified if, during inspections or investigations conducted by the owner/operator, or the applicable local or state regulatory authority, it is determined that the SWPPP is ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site. Modify the SWPPP as necessary to include additional or modified BMPs designed to correct problems identified. Complete revisions to the SWPPP within seven (7) days following the inspection.

Suggested BMPs

- BMP C150: Materials on Hand
- BMP C160: Certified Erosion and Sediment Control Lead
- BMP C162: Scheduling

Element #13: Protect Low Impact Development BMPs

Municipal Stormwater Permits Requirements

- Protect all Bioretention and Rain Garden BMPs from sedimentation through installation and maintenance of erosion and sediment control BMPs on portions of the site that drain into the Bioretention and/or Rain Garden BMPs. Restore the BMPs to their fully functioning condition if they accumulate sediment during construction. Restoring the BMP must include removal of sediment and any sediment-laden Bioretention/rain garden soils, and replacing the removed soils with soils meeting the design specification.
- Prevent compacting Bioretention and rain garden BMPs by excluding construction equipment and foot traffic. Protect completed lawn and landscaped areas from compaction due to construction equipment.
- Control erosion and avoid introducing sediment from surrounding land uses onto permeable pavements. Do not allow muddy construction equipment on the base material or pavement. Do not allow sediment-laden runoff onto permeable pavements.
- Pavements fouled with sediments or no longer passing an initial infiltration test must be cleaned using procedures from the local stormwater manual or the manufacturer's procedures.
- Keep all heavy equipment off existing soils under LID facilities that have been excavated to final grade to retain the infiltration rate of the soils.

Additional Guidance

See Chapter 5: Precision Site Preparation, Construction & Inspection of LID Facilities in the LID Technical Guidance Manual for Puget Sound (2012) for more detail on protecting LID integrated management practices.

Note that the LID Technical Guidance Manual for Puget Sound (2012) is for additional informational purposes only. You must follow the guidance within this manual if there are any discrepancies between this manual and the LID Technical Guidance Manual for Puget Sound (2012).

Suggested BMPs

- BMP C102: Buffer Zone
- BMP C103: High Visibility Fence
- BMP C200: Interceptor Dike and Swale
- BMP C201: Grass-Lined Channels
- BMP C207: Check Dams
- BMP C208: Triangular Silt Dike (TSD) (Geotextile-Encased Check Dam)
- BMP C231: Brush Barrier
- BMP C233: Silt Fence
- BMP C234: Vegetated Strip

Construction Stormwater Pollution Prevention Plan Checklist

Project Name:
City Reference No.
Construction Permit No.
Review Date:
On-site Inspection Review Date:
Construction SWPPP Reviewer:

Section I – CSWPPP Narrative

Construction Stormwater Pollution Prevention Elements

1. ___ Describe how each of the Construction Stormwater Pollution Prevention Elements has been addressed through the Construction SWPPP.
2. ___ Identify the type and location of BMPs used to satisfy the required element.
3. ___ Provide written justification identifying the reason an element is not applicable to the proposal.

Thirteen Required Elements - Construction Stormwater Pollution Prevention Plan

1. ___ Mark Clearing Limits
2. ___ Establish Construction Access
3. ___ Control Flow Rates
4. ___ Install Sediment Controls
5. ___ Stabilize Soils
6. ___ Protect Slopes
7. ___ Protect Drain Inlets
8. ___ Stabilize Channels and Outlets
9. ___ Control Pollutants
10. ___ Control De-Watering
11. ___ Maintain BMPs
12. ___ Manage the Project
13. ___ Protect Low Impact Development BMPs

Project Description

1. _____ Total project area
2. _____ Total proposed impervious area
3. _____ Total proposed area to be disturbed, including off-site borrow and fill areas
4. _____ Total volumes of proposed cut and fill

Construction Stormwater Pollution Prevention Plan Checklist

Project Name:
Construction Permit No.
City Reference No.

Existing Site Conditions

1. ___ Description of the existing topography
2. ___ Description of the existing vegetation
3. ___ Description of the existing drainage

Adjacent Areas

1. ___ Description of adjacent areas which may be affected by site disturbance or drain to project site.
 - ___ a. Streams
 - ___ b. Lakes
 - ___ c. Wetlands
 - ___ d. Residential Areas
 - ___ e. Roads
 - ___ f. Other

2. ___ Description of the downstream drainage path leading from the site to the receiving body of water. (Minimum distance of 400 yards.)

Critical Areas

1. ___ Description of critical areas that are on or adjacent to the site.
2. ___ Description of special requirements for working in or near critical areas.

Soils

1. Description of on-site soils.
 - ___ a. Soil name(s)
 - ___ b. Soil mapping unit
 - ___ c. Erodibility
 - ___ d. Settleability
 - ___ e. Permeability
 - ___ f. Depth
 - ___ g. Texture
 - ___ h. Soil Structure

Construction Stormwater Pollution Prevention Plan Checklist

Project Name:
Construction Permit No.
City Reference No.

Erosion Problem Areas

1. ____ Description of potential erosion problems on site.

Construction Phasing

1. ____ Construction sequence
2. ____ Construction phasing (if proposed)

Construction Schedule

1. ____ Provide a proposed construction schedule.
2. ____ Wet Season Construction Activities
 - ____ a. Proposed wet season construction activities.
 - ____ b. Proposed wet season construction restraints for environmentally sensitive/critical areas.

Financial/Ownership Responsibilities

1. ____ Identify the property owner responsible for the initiation of bonds and/or other financial securities.
2. ____ Describe bonds and/or other evidence of financial responsibility for liability associated with erosion and sedimentation impacts.

Engineering Calculations

1. ____ Provide Design Calculations.
 - ____ a. Sediment Ponds/Traps
 - ____ b. Diversions
 - ____ c. Waterways
 - ____ d. Runoff/Stormwater Detention Calculations

Construction Stormwater Pollution Prevention Plan Checklist

Project Name:
Construction Permit No.
City Reference No.

Section II - Erosion and Sediment Control Plans

General

1. ___ Vicinity Map
2. ___ City/County of _____ Clearing and Grading Approval Block
3. ___ Erosion and Sediment Control Notes

Site Plan

1. ___ Note legal description of subject property.
2. ___ Show North Arrow.
3. ___ Indicate boundaries of existing vegetation, e.g. tree lines, pasture areas, etc.
4. ___ Identify and label areas of potential erosion problems.
5. ___ Identify on-site or adjacent surface waters, critical areas and associated buffers.
6. ___ Identify FEMA base flood boundaries and Shoreline Management boundaries (if applicable).
7. ___ Show existing and proposed contours.
8. ___ Indicate drainage basins and direction of flow for individual drainage areas.
9. ___ Label final grade contours and identify developed condition drainage basins.
10. ___ Delineate areas that are to be cleared and graded.
11. ___ Show all cut and fill slopes indicating top and bottom of slope catch lines.

Conveyance Systems

1. ___ Designate locations for swales, interceptor trenches, or ditches.
2. ___ Show all temporary and permanent drainage pipes, ditches, or cut-off trenches required for erosion and sediment control.
3. ___ Provide minimum slope and cover for all temporary pipes or call out pipe inverts.
4. ___ Show grades, dimensions, and direction of flow in all ditches, swales, culverts and pipes.
5. ___ Provide details for bypassing off-site runoff around disturbed areas.
6. ___ Indicate locations and outlets of any dewatering systems.

Location of Detention BMPs

1. ___ Identify location of detention BMPs.

Construction Stormwater Pollution Prevention Plan Checklist

Project Name:
Construction Permit No.
City Reference No.

Erosion and Sediment Control Facilities

1. ___ Show the locations of sediment trap(s), pond(s), pipes and structures.
2. ___ Dimension pond berm widths and inside and outside pond slopes.
3. ___ Indicate the trap/pond storage required and the depth, length, and width dimensions.
4. ___ Provide typical section views through pond and outlet structure.
5. ___ Provide typical details of gravel cone and standpipe, and/or other filtering devices.
6. ___ Detail stabilization techniques for outlet/inlet.
7. ___ Detail control/restrictor device location and details.
8. ___ Specify mulch and/or recommended cover of berms and slopes.
9. ___ Provide rock specifications and detail for rock check dam(s), if applicable.
10. ___ Specify spacing for rock check dams as required.
11. ___ Provide front and side sections of typical rock check dams.
12. ___ Indicate the locations and provide details and specifications for silt fabric.
13. ___ Locate the construction entrance and provide a detail.

Detailed Drawings

1. ___ Any structural practices used that are not referenced in the Ecology Manual should be explained and illustrated with detailed drawings.

Other Pollutant BMPs

1. ___ Indicate on the site plan the location of BMPs to be used for the control of pollutants other than sediment, e.g., concrete wash water.

Monitoring Locations

1. ___ Indicate on the site plan the water quality sampling locations to be used for monitoring water quality on the construction site, if applicable.

APPENDIX B

BEST MANAGEMENT PRACTICES

STANDARDS AND SPECIFICATIONS

This appendix contains standards and specifications for construction stormwater pollution prevention best management practices consistent with Chapter 4 of Volume II of the 2012 Washington State Department of Ecology Stormwater Management Manual for Western Washington, as amended in December 2014.

Best Management Practices (BMPs) are defined as schedules of activities, prohibitions of practices, maintenance procedures, and structural and/or managerial practices, that when used singly or in combination, prevent or reduce the release of pollutants to waters of Washington State. This chapter contains standards and specifications for temporary BMPs to be used as applicable during the construction phase of a project. Often using BMPs in combination is the best method to meet Construction Stormwater Pollution Prevention Plan (CSWPPP) requirements.

None of the BMPs listed below will work successfully through the construction project without inspection and maintenance. Regular inspections to identify problems with the operation of each BMP, and the timely repair of any problems are essential to the continued operation of the BMPs

Section B.1 contains the standards and specifications for Source Control BMPs.

Section B.2 contains the standards and specifications for Runoff Conveyance and Treatment BMPs.

The standards for each individual BMP are divided into four sections:

1. Purpose
2. Conditions of Use
3. Design and Installation Specifications
4. Maintenance Standards

Note that the “Conditions of Use” always refers to site conditions. As site conditions change, BMPs must be changed to remain in compliance.

B.1 Source Control BMPs

This section contains the standards and specifications for Source Control BMPs. Table B.1.1, below, shows the relationship of the BMPs in Section B.1 to the Construction Stormwater Pollution Prevention Plan (CSWPPP) Elements described in Section A.3.3. Elements not shown on Table B.1.1 are not satisfied through installation of Source Controls.

TABLE B.1.1 SOURCE CONTROL BMPs BY SWPPP ELEMENT

BMP or Element Name	Element #1 Preserve Vegetation/ Mark Clearing Limit	Element #2 Establish Construction Access	Element #5 Stabilize Soils	Element #6 Protect Slopes	Element #8 Stabilize Channels and Outlets	Element #9 Control Pollutants	Element #11 Maintain BMPs	Element #12 Manage the Project	Element #13 Protect Low Impact Development
BMP C101: Preserving Natural Vegetation	✓								
BMP C102: Buffer Zones	✓								✓
BMP C103: High Visibility Fence	✓								✓
BMP C105: Stabilized Construction Entrance / Exit		✓							
BMP C106: Wheel Wash		✓							
BMP C107: Construction Road/Parking Area Stabilization		✓							
BMP C120: Temporary and Permanent Seeding			✓	✓					
BMP C121: Mulching			✓	✓					
BMP C122: Nets and Blankets			✓	✓	✓				
BMP C123: Plastic Covering			✓	✓					
BMP C124: Sodding			✓	✓					
BMP C125: Topsoiling / Composting			✓						
BMP C126: Polyacrylamide (PAM) for Soil Erosion Protection			✓						
BMP C130: Surface Roughening			✓	✓					
BMP C131: Gradient Terraces			✓	✓					
BMP C140: Dust Control			✓						
BMP C150: Materials on Hand							✓	✓	
BMP C151: Concrete Handling						✓			
BMP C152: Sawcutting and Surfacing Pollution Prevention						✓			
BMP C153: Material Delivery, Storage and Containment						✓			
BMP C154: Concrete Washout Area						✓			
BMP C160: Certified Erosion and Sediment Control Lead							✓	✓	
BMP C162: Scheduling								✓	

[BMP-C101: Preserving Natural Vegetation](#)
[BMP-C102: Buffer Zones](#)
[BMP-C103: High Visibility Fence](#)
[BMP-C105: Stabilized Construction Entrance/Exit](#)
[BMP-C106: Wheel Wash](#)
[BMP-C107: Construction Road/Parking Area Stabilization](#)
[BMP-C120: Temporary and Permanent Seeding](#)
[BMP-C121: Mulching](#)
[BMP-C122: Nets and Blankets](#)
[BMP-C123: Plastic Covering](#)
[BMP-C124: Sodding](#)
[BMP-C125: Topsoiling / Composting](#)
[BMP-C126: Polyacrylamide \(PAM\) for Soil Erosion Protection](#)
[BMP-C130: Surface Roughening](#)
[BMP-C131: Gradient Terraces](#)
[BMP-C140: Dust Control](#)
[BMP-C150: Materials on Hand](#)
[BMP-C151: Concrete Handling](#)
[BMP-C152: Sawcutting and Surfacing Pollution Prevention](#)
[BMP-C153: Material Delivery, Storage and Containment](#)
[BMP-C154: Concrete Washout Area](#)
[BMP-C160: Certified Erosion and Sediment Control Lead](#)
[BMP-C162: Scheduling](#)

B.2 Runoff Conveyance and Treatment BMPs

This section contains the standards and specifications for Runoff Conveyance and Treatment BMPs. Table B.2.1, below, shows the relationship of the BMPs in Section B.2 to the Construction Stormwater Pollution Prevention Plan (SWPPP) Elements described in Section A.3.3.

Table B.2.1 Runoff Conveyance and Treatment BMPs by SWPPP Element

BMP or Element Name	Element #3 Control Flow Rates	Element #4 Install Sediment Controls	Element #6 Protect Slopes	Element #7 Protect Drain Inlets	Element #8 Stabilize Channels and Outlets	Element #9 Control Pollutants	Element #10 Control DeWatering	Element #13 Protect Low Impact Development
BMP C200: Interceptor Dike and Swale			✓					✓
BMP C201: Grass-Lined Channels			✓					✓
BMP C202: Channel Lining					✓			
BMP C203: Water Bars	✓		✓				✓	
BMP C204: Pipe Slope Drains			✓					
BMP C205: Subsurface Drains			✓					
BMP C206: Level Spreader			✓				✓	
BMP C207: Check Dams	✓		✓		✓			✓
BMP C208: Triangular Silt Dike (TSD) (Geotextile Encased Check Dam)			✓					✓
BMP C209: Outlet Protection	✓				✓			
BMP C220: Storm Drain Inlet Protection				✓				
BMP C231: Brush Barrier		✓						✓
BMP C232: Gravel Filter Berm		✓						
BMP C233: Silt Fence		✓						✓
BMP C234: Vegetated Strip		✓						✓
BMP C235: Wattles	✓	✓						
BMP C236: Vegetated Filtration							✓	
BMP C240: Sediment Trap	✓	✓						
BMP C241: Temporary Sediment Pond	✓	✓						

Table 4.2.1 Runoff Conveyance and Treatment BMPs by SWPPP Element (cont.)

BMP or Element Name	Element #3 Control Flow Rates	Element #4 Install Sediment Controls	Element #6 Protect Slopes	Element #7 Protect Drain Inlets	Element #8 Stabilize Channels and Outlets	Element #9 Control Pollutants	Element #10 Control DeWatering	Element #13 Protect Low Impact Development
BMP C250: Construction Stormwater Chemical Treatment		✓				✓		
BMP C251: Construction Stormwater Filtration		✓				✓		
BMP C252: High pH Neutralization Using CO ₂						✓		
BMP C253: pH Control for High pH Water						✓		

[BMP-C200: Interceptor Dike and Swale](#)
[BMP-C201: pH Control for High pH Water](#)
[BMP-C202: Channel Lining](#)
[BMP-C203: Water Bars](#)
[BMP-C204: Pipe Slope Drains](#)
[BMP-C205: Subsurface Drains](#)
[BMP-C206: Level Spreader](#)
[BMP-C207: Check Dams](#)
[BMP-C208: Triangular Silt Dike \(TSD\) \(Geotextile-Encased Check Dam\)](#)
[BMP-C209: Outlet Protection](#)
[BMP-C220: Storm Drain Inlet Protection](#)
[BMP-C231: Brush Barrier](#)
[BMP-C232: Gravel Filter Berm](#)
[BMP-C233: Silt Fence](#)
[BMP-C234: Vegetated Strip](#)
[BMP-C235: Wattles](#)
[BMP-C236: Vegetative Filtration](#)
[BMP-C240: Sediment Trap](#)
[BMP-C241: Temporary Sediment Pond](#)
[BMP-C250: Construction Stormwater Chemical Treatment](#)
[BMP-C251: Construction Stormwater Filtration](#)
[BMP-C252: High pH Neutralization Using CO₂](#)
[BMP-C253: pH Control for High pH Water](#)

APPENDIX C

CONSTRUCTION STORMWATER POLLUTION PREVENTION ADDITIONAL STANDARDS AND SPECIFICATIONS FOR LOCAL REGULATIONS AND PRACTICES

APPENDIX CONTENTS AND FIGURES:

Alternate Materials, Methods, or Modifications Request Form
Turbidity and pH Monitoring Requirements Standards for Plans
CSWPPP Short Form for Small Construction Projects
Construction Emergency Contact Sheet

Site Inspection Form

Geotechnical Report Requirements
Detail COB T101- Tree Protection BMPs
Standard Notes for Erosion Control Plans

Background Information on Chemical Treatment



What is an alternate materials, methods, or modifications application process?

It is a permitted use of alternate materials or methods of construction not specifically prescribed in the IBC, IMC, UPC, NEC, WAC 51-11 (Energy Code), WAC 51-13 (Ventilation and Indoor Air Quality Code) or City of Bellevue Construction Code. Modifications to code requirements are allowed only when there are significant difficulties encountered making it impractical to carry out the prescriptive provisions of the applicable code. The proposed alternate materials, methods, or modifications may be permitted where the equivalent objectives prescribed by the code can be achieved by establishing and maintaining effective fire and life safety, structural integrity, strength, fire resistance, sanitation, and/or equipment suitability. (BCC 23.05.080 (H-M) / BCC 23.05.040)

What is not acceptable under the alternate materials and methods application process?

The use of alternative materials, methods of construction, or modifications will not avoid compliance with the objectives or intention of the code section, rule, or ordinance. An application will not be granted if the alternative material, methods, or modifications would reduce the levels of fire and life safety, structural integrity, strength, fire resistance, sanitation, and/or equipment suitability required by the code.

What does an acceptable alternate materials, methods, or modifications application cover?

If use of alternative materials or methods of construction is granted, it is site specific and must be limited to the case(s) covered in the application and will not be applicable to future installations or equipment, unless specifically allowed by the building official. The application approval may be revoked for cause.

What if the alternate materials, methods, or modifications application is denied?

When an alternate materials, methods, or modifications application is denied, an appeal may be directed to the Hearing Examiner as provided in BCC 23.05.160. Interim acceptance of the installation, pending outcome of an appeal, will be at the discretion of the Building Official and must be in writing.

Who may apply for use of alternate materials and/or methods of construction?

Only the owner, owner's agent, or the contractor may apply to use alternate materials, methods of construction or modifications. Applications must be in writing.

Who grants the use of alternate materials and/or methods of construction?

The use of alternate materials, methods of construction, or modifications is granted only by the City of Bellevue Building Official upon written request, under authority of. (BCC 23.05.080 (H-M) / BCC 23.05.040).

(City of Bellevue Ordinance 5528)

Applications are to be mailed to:

Gregory H. Schrader
City of Bellevue Building Official
450 – 110th Avenue NE Bellevue,
Washington 98004

For Department Use Only

Date Received	Date Received	Date Reviewed	Date Completed	Approval: <input type="checkbox"/> Yes <input type="checkbox"/> No
---------------	---------------	---------------	----------------	--

Project Name:		Permit Number:		Application Date	
Project Address:			Property Owner		
Contact Person		Title:		Address	
Address			City, State Zip		
Phone Number:	Fax Number	E-mail	Phone Number	Fax Number:	

Type of Project: Building Electrical Mechanical Plumbing Clear & Grade

Type of Request: Alternate Materials Alternate Methods Modification of Code or Standard

Has the installation been made? <input type="checkbox"/> Yes <input type="checkbox"/> No	Has a violation been noted? <input type="checkbox"/> Yes <input type="checkbox"/> No	Date:	Inspector/Plans Examiner:
Applicable Code/Standard: <input type="checkbox"/> IBC <input type="checkbox"/> IRC <input type="checkbox"/> IMC <input type="checkbox"/> UPC <input type="checkbox"/> COBCC <input type="checkbox"/> Other:			
Specific Code, Section, Rule or Standard:			

Statement of Problem(s): _____

Alternate Proposal: (Attach additional pages, plans, drawings, technical reports, descriptions, etc. to support proposal)

I certify that I am the owner or owner's agent and have the authority to request the above stated alternate materials, methods of construction, or modification in building code requirements. I understand that this request is subject to review and may be approved or denied in part or in whole. The city of "Bellevue's decision will be in writing and will be specific to this request, unless otherwise noted, and is based solely on the facts included with this request.

Signature	Title	Date
Print Name		

For Department Use Only		
Reviewed By:	Date:	Recommendation:
Comments:		<input type="checkbox"/> Approve <input type="checkbox"/> Deny
Reviewed By:	Date:	Recommendation:
Comments:		<input type="checkbox"/> Approve <input type="checkbox"/> Deny
Reviewed By:	Date:	Recommendation:
Comments:		<input type="checkbox"/> Approve <input type="checkbox"/> Deny
Reviewed By:	Date:	Recommendation:
Comments:		<input type="checkbox"/> Approve <input type="checkbox"/> Deny

Final Review:

Date:

Final Status:

Comments/Conditions:



What are Turbidity and pH?

Turbidity is the clarity of water expressed as nephelometric turbidity units (NTU's) and is measured with a calibrated turbidity meter (turbidimeter). The level of turbidity is determined by measuring the amount of light that passes through a standard sample of the water. **pH** is a measure of the acidity or basicity of a solution and is measured using pH indicator paper or a calibrated pH meter.

Code Authority:

The Clearing and Grading Code (BCC 23.76.160) permits the Development Services Department Director to require performance monitoring to determine compliance with State Surface Water Quality Standards (WAC 173.201A-200).

State Surface Water Quality Standards (WAC 173.201A-200).

The standard for turbidity is:

Not to exceed 5 NTU over upstream turbidity when upstream turbidity is 50 NTU or less; and not to exceed 10% above upstream turbidity when upstream turbidity is greater than 50NTU.

For construction turbidity monitoring, turbidity benchmarks of 25 and 250 NTU are used. It is presumed that turbidity of 25 NTU or less is not likely to cause an exceedance of state water quality standards under most conditions, and BMPs are thought to be functioning well. Turbidity readings above 25 NTU indicate BMPs are not functioning properly, and action must be taken to correct problems. If the turbidity benchmark of 250 NTU is exceeded, there is a much higher risk of exceeding standards. In this event, immediate corrective actions must be taken, and Washington State Department of Ecology (Ecology) must be notified within 24 hours (425-649-7000).

The standard range for pH is:

6.5 to 8.5 with a human caused variation within that range of less than 0.2 units.

The benchmark value for pH is 8.5 standard units. Any time sampling indicates that pH is 8.5 or greater, the high pH water (8.5 or above) must be prevented from entering the storm drainage system or surface waters, and, if necessary, the high pH water must be adjusted or neutralized.

Turbidity & pH Monitoring Plan Requirements:

An acceptable turbidity & pH monitoring plan will include the following elements:

1. Project Description – This section of the plan must identify the purpose of the site clearing and grading, include a discussion of the extent of site disturbance required for the proposal, any proposed phasing of the project, the extent of concrete work, and/or cement treatment, and a brief description of the Temporary Erosion and Sediment Control (TESC) Plan.
2. Drainage Analysis – This section, at a minimum, must include a discussion of: i) the general topography; ii) existing drainage patterns on-site including existing drainage features (i.e. wetlands, streams, ditches, catch basins, pipes, ponds etc.); and iii) location of protected areas (i.e. steep slopes, wetlands, riparian corridors and shorelines).
3. Monitoring Locations – Sampling is required at all discharge points where stormwater (or authorized non-stormwater) is discharged off-site, before it mixes with the storm drainage system or receiving waters. All sampling point(s) must be identified on the CSWPPP site plan and be clearly marked in the field with a flag, tape, paint, stake or another visible marker. Background turbidity and pH must be measured in the waterway that receives runoff

from the sites(s) at a location up-gradient or outside the influence of discharge from the construction site. Background turbidity and pH must be measured each time discharge turbidity is measured.

4. Turbidity & pH Monitoring Data Sheet – Include in the monitoring plan an example data sheet to record daily monitoring data. An example Data Sheet is attached to these requirements, which may be used directly, or as a reference to develop a project specific data sheet. Project specific data sheets must include all of the information on the example sheet, but may provide additional information.
5. Third Party Monitor - The plan must identify a qualified, professional monitoring company that will be responsible for providing turbidity & pH monitoring. The company may not be affiliated with any party with a vested interest in the project. The individual(s) who will be conducting the monitoring must be a certified erosion and sediment control lead (CESCL).
6. Field Testing Methods – Turbidity & pH monitoring equipment must be specified in the monitoring plan, and must comply with the requirements of the EPA and provide immediate results in the field.
7. Frequency of Monitoring – During the Dry Season (May 1 – September 30) sampling must be performed no less than one sample weekly. Additional samples must be taken during or immediately after each rainfall event. No more than one sample will be required in a day if the test indicates that turbidity complies with allowable levels. If the test indicates that turbidity is in excess of the standard or turbid water is observed coming from the site after the initial sample is taken, additional samples may be required. Sampling during the Rainy Season (October 1 – April 30) must be done daily.
8. Reporting Requirements – Sampling data sheets must be delivered, e-mailed, or faxed to the City of Bellevue Clearing and Grading Inspector the same day they are taken (e-mail address: clearandgradereview@bellevuewa.gov; FAX # (425) 452-7930). Delivery of data sheets must be arranged with the inspector prior to collection of the data.
9. Exceeding Turbidity Benchmarks – Upon determination of turbidity levels in excess of the 25 NTU benchmark (26 to 249 NTU); the CESCL must immediately notify the contractor. The contractor must make all necessary efforts to correct the condition(s) on site that is (are) causing, or contributing to, the excess turbidity. It is the responsibility of the contractor to determine the most appropriate measures and implement them immediately, although they may solicit input from the inspector, the CESCL, or any other outside resource. The CESCL must make the appropriate revisions to the CSWPPP

Upon determination that turbidity levels exceed the 250 NTU benchmark, the CESCL must immediately notify the contractor and the Clearing and Grading Inspector. The Clearing and Grading Inspector will forward the information to the Bellevue Clearing and Grading Supervisor who will notify Ecology within 24 hours. Immediate corrective actions must be taken by the contractor to correct the problems. The CESCL must continue to sample discharge daily until Turbidity is <25 NTU or the discharge is eliminated. The clearing and grading inspector has the authority to require additional TESC measures and/or issue a Stop Work order to mitigate water quality concerns.

10. Exceeding pH Benchmark - Any time sampling indicates that pH of discharge water is 8.5 or greater, the high pH water must be prevented from entering storm drainage system or surface waters. If necessary, adjust or neutralize the high pH water using an appropriate treatment BMP such as CO₂ sparging or dry ice. Written approval from Ecology must be obtained before using any form of chemical treatment other than CO₂ sparging or dry ice.

Termination of Monitoring Services - Upon termination of monitoring services, the third-party monitoring company must submit a final report to the Clearing and Grading Inspector. The report must indicate the reason for termination of services, a summary of turbidity and pH data obtained throughout the project, final turbidity and pH levels, and any outstanding issues that have not been fully addressed.

Turbidity & pH Monitoring Data Sheet

Project Name _____ Permit Number _____

Site Address _____

Name of CESCL _____ Phone Number _____

Name of Monitoring Company _____

Date & Time of Sample _____

Weather Conditions: _____

Sampling Location	Turbidity Reading (NTU)	Turbidity Above Benchmark? (Y/N)	pH Reading	pH Above Benchmark? (Y/N)	Contractor Notified of results? (Y/N)

Corrective Measure Taken by Contractor (if turbidity increase is above standard): _____

Other Comments: _____



Construction Stormwater Pollution Prevention Plan (CSWPPP) Short Form for Small Construction Projects

The Bellevue clearing and grading code (BCC 23.76.090) allows sites with land disturbing activities totaling less than 7,000 square feet and grading less than 500 cubic yards to prepare a simpler CSWPPP consisting of a [short form narrative \(this form\)](#) an **ESC (Erosion and Sediment Control) plan**, and the appropriate **BMP details/specifications**. The purpose of the CSWPPP is to outline the actions that will be implemented on smaller construction sites to reduce or eliminate discharge of sediment and other pollutants into receiving waters.

Background Information

Property Owner:

Contact Person:

(If different from the owner, all questions and correspondence will be directed to the individual listed as contact person.)

Address of Contact Person:

Phone Number:

Project Title:

Site Address:

Parcel Number:

Give an accurate, brief description of the proposed project's scope and nature:

1. General description:

2. Area of site (square feet or acres):
3. Proposed area of land disturbance (square feet or acres):
4. Proposed quantity of excavation (cubic yards):
5. Proposed quantity of fill (cubic yards):
6. Square footage of buildings to be constructed:
7. Description of adjacent areas which may be affected by site disturbance (i.e. streams, lakes, wetlands, residential areas, roads)

8. Description of critical areas that are on or adjacent to the site.

9. Describe potential erosion problems on-site.

Required Elements - Construction Stormwater Pollution Prevention Plan

Indicate the BMPs to be used for each element. If site conditions render an element unnecessary, check "other" and describe why it is not needed.

1. Mark Clearing Limits
 - Preserve existing vegetation – BMP C 101
 - High Visibility Plastic or Metal Fence – BMP C103
 - Tree Protection During Construction – BMP T101
 - Other

2. Establish Construction Access
 - Stabilized Construction Entrance – BMP C105
 - Wheel Wash – BMP C106
 - Construction Road/Parking Area Stabilization – BMP C107
 - Other

3. Control Flow Rates
 - Sediment trap – BMP C240
 - Other

4. Install Sediment Controls
 - Vegetated strip – BMP C234
 - Silt Fence – BMP C233
 - Straw wattles – BMP C235
 - Other

5. Stabilize Soils
 - Mulching – BMP C121
 - Plastic Covering – BMP C123
 - Topsoiling – BMP C125
 - Sodding – BMP C124
 - Nets & blankets – BMP C122
 - Temporary & Permanent Seeding – BMP C120
 - Other

6. Protect Slopes
 - Temporary & permanent seeding – BMP C120
 - Plastic covering – BMP C123
 - Interceptor dike and swale – BMP C200
 - Nets & blankets – BMP C122
 - Other

7. Protect Drain Inlets
 - Storm drain inlet protection – BMP C220
 - Other

8. Stabilize Channels and Outlets
 - Channel lining – BMP C202
 - Outlet protection – BMP C209
 - Other

BMP Details

Attach to the CSWPPP narrative a copy of each BMP detail/specification that is called out on the narrative. The BMP standard details can be downloaded from <https://development.bellevuewa.gov/codes-and-guidelines/clearing-grading-codes-and-guidelines/>

ESC (Erosion and Sediment Control) Plan

Attach a site plan (minimum 11" x 17") that includes the following:

- a. Legal description of subject property.
- b. North Arrow
- c. Property boundaries
- d. Boundaries of existing vegetation, e.g. tree lines, pasture areas, etc.
- e. Identify and label areas of potential erosion problems.
- f. Identify any on-site or adjacent surface waters, critical areas and associated buffers.
- g. Identify FEMA base flood boundaries and Shoreline Management boundaries (if applicable)
- h. Show existing and proposed contours.
- i. Delineate areas that are to be cleared and graded.
- j. Indicate location of BMPs and other required CSWPPP elements.
- k. Name and phone number of person(s) responsible for preparation and maintenance of the CSWPPP.

Note: The ESC plan can be included on the project site plan, provided the plan remains legible.

CONSTRUCTION EMERGENCY CONTACT SHEET

Date _____

Project Name: _____

Project Address: _____

Type of Work: _____

Developer: _____

Contact: _____ Office: _____ 24-hr: _____

General Contractor: _____

Contact: _____ Office: _____ 24-hr: _____

Utilities Sub-Contractor: _____

President/Owner: _____

Office: _____ Home: _____ 24-hr: _____

Project Manager: _____

Office: _____ Home: _____ 24-hr: _____

Superintendent: _____

Office: _____ Home: _____ 24-hr: _____

Foreman: _____

Office: _____ Home: _____ 24-hr: _____

Erosion Control Lead: _____

Office: _____ Home: _____ 24-hr: _____

City of Bellevue Inspectors

Clearing & Grading Inspector: _____

Office: (425) 452- _____

Building Inspector: _____

Office: (425) 452- _____

CONSTRUCTION EMERGENCY CONTACT SHEET

INJURY or FIRE– Call 911

Project Location or Address (If no address, describe the location of the construction access so that it can be relayed to emergency responders)

SPILL (Any hazardous materials including diesel fuel, gasoline, hydraulic fluid that enters the storm drain system or receiving waters)

- Call Washington State Department of Ecology (24 hrs.) 425-649-7000
- Call Utilities Operations & Maintenance 425-452-7840
- Call Clearing & Grading Inspector or 425-452-4570

FISH KILL OR DISTRESS

- Call Washington Department of Fish and Wildlife Area Habitat Biologist 425-313-5683
- Call Clearing & Grading Inspector or 425-452-4570

WATER QUALITY IMPACTS (Site stormwater runoff turbidity exceeds 250 ntu)

- Call Washington State Department of Ecology (24 hrs.) 425-649-7000
- Call Clearing & Grading Inspector or 425-452-4570

ARCHAEOLOGICAL FINDS

- Call Clearing & Grading Inspector or 425-452-4570
- Call Army Corps of Engineers, Seattle office, Lyz Ellis, 206-764-3634 (This is all you need to do under the permit)
Or if there is no response and there is a need for immediate help, call Dr. Whitlam at the Washington State Office of Historic and Archaeological Program (OHAP), 360-407-0771

Project _____ Permit No. _____

Inspector _____ Date _____ Time _____

Inspection Type: After a rain event Weekly Turbidity benchmark exceedance

Other – explain: _____

Weather: _____

Precipitation: Since last inspection _____ inches In last 24 hours _____ inches

Description of General Site Conditions: _____

Will existing BMPs need to be modified or removed, or other BMPs installed? YES NO

If YES, list the action items to be completed on the following table:

Actions to be Completed	Date Completed/ Initials
1.	
2.	
3.	
4.	
5.	

Was water quality sampling (turbidity and pH) part of this inspection? YES NO

If yes, attach Turbidity & pH Monitoring Data Sheet

Is the site in compliance with the CSWPPP and the permit requirements? YES NO

- If no, indicate the tasks necessary to bring the site into compliance on the "Actions to be Completed" table above, and include dates each job will be completed.

• If no, has the non-compliance been reported to the City of Bellevue? YES NO

• If no, should the CSWPPP be modified? YES NO

I certify that this report is true, accurate, and complete, to the best of my knowledge and belief. Name of Inspector (print) _____ Title/Qualification _____

Signature _____ Date _____

**CSWPPP
SITE INSPECTION FORM**

Project _____ Permit No. _____
 Inspector _____ Date _____ Time _____

Site BMPs	Overall Condition	Need Repair?	Comments/Observations
Element 1: Clearing Limits <ul style="list-style-type: none"> • Existing vegetation • Plastic or Metal Fence • 	G F P G F P G F P	Y N Y N Y N	
Element 2: Construction Access <ul style="list-style-type: none"> • Stabilized Construction Entrance • • • 	G F P G F P G F P G F P	Y N Y N Y N Y N	
Element 3: Control Flow Rates <ul style="list-style-type: none"> • Sediment trap • • 	G F P G F P G F P	Y N Y N Y N	
Element 4: Sediment Controls <ul style="list-style-type: none"> • Silt Fence • Straw wattles • • 	G F P G F P G F P G F P	Y N Y N Y N Y N	
Element 5: Stabilize Soils <ul style="list-style-type: none"> • Mulch • Plastic Covering • • 	G F P G F P G F P G F P	Y N Y N Y N Y N	
Element 6: Protect Slopes <ul style="list-style-type: none"> • Plastic covering • Seeding • 	G F P G F P G F P	Y N Y N Y N	
Element 7: Protect Drain Inlets <ul style="list-style-type: none"> • Storm drain inlet protection • • 	G F P G F P G F P	Y N Y N Y N	
Element 8: Stabilize Channels & Outlets <ul style="list-style-type: none"> • Outlet protection • • 	G F P G F P G F P G F P	Y N Y N Y N Y N	
Element 9: Control Pollutants <ul style="list-style-type: none"> • Concrete Handling • Material Delivery, Storage Containment 	G F P G F P G F P	Y N Y N Y N	

•	G	F	P	Y	N
Element 10: Control Dewatering	G	F	P	Y	N
Element 13: Protect Low Impact					
Development BMPs					
• Buffer Zones	G	F	P	Y	N
• High Visibility Fence	G	F	P	Y	N
• Silt Fence	G	F	P	Y	N
• Vegetated Strip	G	F	P	Y	N



GEOTECHNICAL REPORTING REQUIREMENTS

A geotechnical engineering report is required for all Clearing and Grading Permit applications submitted to the City of Bellevue. The geotechnical report must have been completed less than 5 years before the date of application and must pertain to the site and project described in the application. A geotechnical report older than 5 years or one for a different project on the same site may be accepted if the Geotechnical Engineer provides an addendum updating the report, or a letter stating the report is applicable to the site and the project currently proposed. Geotechnical reporting requirements may be waived for single-family permits if the applicant can demonstrate, to the satisfaction of the City of Bellevue, that soil or groundwater conditions at or near the site pose little or no risk for the project and that no on-site stormwater management practices are required for the project.

It is the responsibility of the Geotechnical Engineer to determine the actual scope of investigation, analysis, and reporting necessary to meet the Standard of Practice with respect to the project and its geotechnical requirements. The report must be signed and sealed by the Geotechnical Engineer.

The attached report outline describes the basic elements the City of Bellevue requires in each geotechnical report. The thoroughness of each element will greatly depend on the nature and complexity of the project and site conditions. For example, a report for a single family residence on a glacial till site without groundwater issues warrants a short, simple report, while a high-rise structure with a deep excavation on an alluvial site warrants a longer, much more detailed report. All elements should be included in detail unless they are clearly not applicable. For example, slope stability could be excluded if there are no slopes on the site or surrounding area, or shoring and retaining walls could be excluded if there are no requirements for temporary or permanent soil or rock retention.

GEOTECHNICAL REPORT

OUTLINE SUMMARY

The summary presents the major conclusions and their basis. This section should be included in all lengthy or complex reports.

1.1 INTRODUCTION

The Introduction sets the stage for the entire report and should be contained in the following sections:

1.2 OVERVIEW

- Introduce the formal project name and state the location.
- Briefly describe current or previous work used to form the basis for the conclusions and recommendations contained in the report.

1.3 BACKGROUND

- Provide a description of the project's history if it is important to understanding why the study was performed.
- List other reports completed for the site or adjacent sites and note whether any environmental site assessments or other environmental work has been completed for the site.
- Provide a general description and give dimensions of the project including the general nature of the proposed development, e.g. grading, retaining walls, structures, construction materials, and utilities. Also, include proposed finish floor elevations, maximum depth of cut or fill, foundation and floor loads, etc.
- Describe all other details of the project which were assumed or relied upon in developing the conclusions and recommendations contained in the report.

1.4 PURPOSE AND SCOPE OF SERVICES

- State succinctly the primary purpose for the geotechnical engineering services.
- Summarize the scope of geotechnical engineering services which form the basis for the conclusions and recommendations contained in the report.
- Indicate any limitations to the scope of geotechnical engineering services provided, particularly if the scope represents a departure from services typically provided on similar projects.

1.5 INVESTIGATION SUMMARY

- Describe the dates, general nature, and extent of the geotechnical investigation. This section should include data research, borings, test pits, geophysics, physical laboratory testing, chemical testing, field instrumentation or testing, infiltration testing, etc.
- If the investigation was complex, present a complete and detailed explanation and results in the form of an appendix.

1.6 REPORT OVERVIEW

- Introduce and describe other sections of the report, directing the reader to critical sections, if appropriate.
- Identify and describe all attachments and appendices.

2.1 SITE CONDITIONS

The Site Conditions shall describe all site features relevant to the study and the geotechnical engineering conclusions and recommendations. Terminology should be clear and consistent, and continue to be consistent through the entire report.

2.2 LOCATION AND SURFACE CONDITIONS

- Present the project's specific address, location and cross streets.
- Generally, describe the site and adjoining properties, and indicate their current use.

- Describe surface elevation, topography and drainage. Clearly reference all elevations to City of Bellevue NAVD88 datum.
- Identify all current structures, subsurface utilities, wells, manmade fills, and other surface features.
- Describe vegetation, topsoil, paving, and other surface coverings.
- Describe any indications of historic geological processes or hazards on or near the site (i.e., slope instability, landslides, liquefaction, flooding, etc.).
- Describe any indications of surface releases or other contamination, or potential contamination sources.
- Describe any planned changes to the surface conditions described above which will take place after the investigation.

2.3 GEOLOGIC SETTING

- Provide an overview of regional geology, local stratigraphy, groundwater occurrence, etc.

2.4 SUBSURFACE SOIL CONDITIONS

- Describe each soil or geologic unit encountered by their classification and group units with respect to the properties that are most relevant to the conclusions and recommendations. Give each unit group a unique, clear, common title and consistently refer to this unit by its given title throughout the report.
- Provide the results of field soil infiltration tests for on-site stormwater management.
- Provide important results of the laboratory physical property testing and its indications of soil behavior.
- Avoid detailed descriptions of the sequence of units found in individual borings; rather, focus on variations in the units across the site, if appropriate. Refer the reader to the exploration logs for details.
- Describe any expected changes in subsurface conditions that may occur with time after the investigation.

2.5 GROUNDWATER CONDITIONS

- Describe the nature and occurrence of groundwater.
- Provide an opinion on likely seasonal variations in groundwater levels or flows, and the possibility for changes from those encountered at the time of exploration.
- Show groundwater levels on soil logs.

2.6 SUBSURFACE CONTAMINATION

- Describe the nature and extent of soil and/or groundwater contamination as revealed by the explorations. Reference any applicable Environmental Assessments if performed.
- Provide important results of the analytical laboratory testing and indications about contamination distribution and concentration.
- Indicate limitations of knowledge on the nature and extent of contamination.
- Discuss possible changes that may occur in these conditions over time.

3.1 DISCUSSION AND CONCLUSIONS

The Discussion and Conclusions should set out major geotechnical issues and alternatives for the project, along with the Geotechnical Engineer's conclusions, in a succinct and clear manner. This section shall clearly describe the logic and reasoning supporting the recommended approach, or alternative approaches. Specific recommendations shall be very limited in this section; they should be presented in a separate Recommendations section.

Discussions and conclusions should:

- Build on information described in the previous sections.
- Use consistent terminology to describe project features, soils, and construction materials.
- Explain any apparent inconsistencies in the data or investigation.
- Clearly describe any limitations or restrictions to the conclusions and recommendations.

3.2 SLOPE STABILITY

- Summarize data and analysis used to evaluate slope stability.
- Provide an opinion regarding the risk of instability on the site or adjacent properties currently, during construction, and after the project is completed.
- Describe how design and construction recommendations will reduce or eliminate the risk of instability.
- Discuss any construction or post-construction measures necessary to verify slope stability.

3.3 SEISMIC CONSIDERATIONS

- Provide an opinion on the expected level of ground motion during a major earthquake. For seismic analyses, acceleration factors should be estimated based on a peak ground acceleration with a 10 percent of probability of exceedance in 50 years (i.e. a 475-year return period). Alternatively, a site- specific seismic study can be conducted to determine an appropriate peak ground acceleration.
- Describe any seismic risks associated with an earthquake such as liquefaction, lateral spreading, landslides, or flooding.
- Describe how design and construction recommendations will reduce or eliminate the impact of seismic risks.

3.4 SITE WORK

- Describe what is anticipated for site grading and earthwork and provide an opinion on the proper sequence and approach to accomplish the site work.
- Describe key issues which will impact proper earthwork, including short term slope stability, on-site and import fill materials, groundwater and drainage, rainfall and moisture sensitive soils, and erosion.
- Describe how these issues should be addressed during construction, including dewatering, temporary retaining structures, and erosion control.
- Include specific recommendations for on-site erosion control based on erosivity of site soil and presence of groundwater, surface water, and slopes.
- Include statements regarding the importance of construction monitoring by a geotechnical engineering firm.

3.5 INFILTRATION

- Describe which of 4 methods allowed in the Utility Engineering Standards (Storm chapter D2-06.5) was used to determine infiltration rates.
- Summarize data and analysis used to evaluate site suitability for infiltration facilities.
- Show location(s) of any infiltration tests on the site plan, and call out areas with infiltration rates suitable for infiltration facilities on the site plan.
- Estimate infiltration rates in inches per hour at depth sufficient to include those elevations up to the required depth (up to five feet) below proposed infiltration facilities and in areas deemed unsuitable for infiltration.
- Provide an opinion on the risk of onsite and downslope flooding or erosion that may result from infiltration facilities in any soils suitable for infiltration.
- Describe how design and construction recommendations will reduce or eliminate the risk of facility failure, erosion and flooding.

3.6 RETAINING STRUCTURES

- If temporary retaining systems are necessary, provide an opinion as to the most appropriate type of temporary retaining system or systems.
- Summarize the data and analysis used to evaluate permanent retaining systems.
- If permanent retaining systems are necessary, provide an opinion on the most appropriate permanent retaining system or systems and describe their expected performance with respect to stability and deflection.
- If reinforced soil slopes or reinforced soil backfill are to be used, clearly define all limitations on backfill materials, reinforcement, and drainage.
- If rockeries, modular block walls, or other non-structural slope protection systems are expected, describe the limitations on such systems.
- Emphasize any aspects of site work, particularly with respect to native soil materials, backfill, and drainage, which could impact performance of the retaining structures.
- Include statements regarding the importance of construction monitoring by a geotechnical engineering firm.

3.7 ROCKERIES & MODULAR BLOCK WALLS

- Emphasize that rockeries and modular small block walls are not retaining walls or structures.
- Indicate that the primary function of a rockery or block wall is to protect the slope face by preventing soil erosion and sloughing. Rockeries and block walls should be considered maintenance items that will require periodic inspection and repair. Thus, rockeries and block walls should be located so that they can be reached by a contractor if repairs become necessary.
- Discuss what type of inspection and testing may be required during rockery or block wall construction.

3.8 FOUNDATION SUPPORT

- Summarize the data and analysis used to evaluate foundation systems.
- Provide an opinion on the most appropriate foundation system and alternatives, along with the expected level of performance with respect to load capacity and settlement.
- Emphasize any aspects of site work which could impact the performance of foundations.
- Include statements regarding the importance of construction monitoring by a geotechnical engineering firm.

4.1 RECOMMENDATIONS

The Recommendations should present all detailed geotechnical engineering recommendations for design and construction in a clear and logical sequence. For each item covered in the recommendations sections, present the following:

- Specific design recommendations along with their limitations, factors of safety, minimum dimensions, and effect of expected variations in actual conditions.
- Specific construction recommendations including definitions, materials, execution, monitoring, testing, or other quality control measures, and any other construction requirements to support the design recommendations.
- Responsibility for seeing that each recommendation is met, such as owner, geotechnical engineer, other design consultants, or contractor. The ultimate responsibility is held by the owner of the project; however, all design parties have shared responsibility. Construction responsibilities are directly related to the contractor.

4.2 SITE GRADING AND EARTHWORK

- Provide specific design recommendations for 1) depth of stripping, 2) soil excavation limits and slopes, 3) depth and lateral limits of over excavation to remove unsuitable materials, 4) preload fills, 5) location and thickness of particular fill material or compaction requirements, 6) maximum temporary and permanent slopes, 7) permanent surface and subsurface drainage systems, and 8) permanent erosion controls.
- Provide specific construction recommendations for 1) clearing, 2) on-site and/or import fill materials, 3) excavation and compaction equipment, 4) fill material moisture conditioning, placement, and compaction, 5) proof-rolling, in-place density testing, and other quality control measures, 6) temporary seepage and drainage control measures, 7) permanent surface or subsurface drainage system installation (as appropriate), 8) temporary slope protection and erosion control measures, and 9) protection of infiltration facilities (including bioretention and pervious pavement) from compaction and from sediment contamination during construction.
- All design and construction methodologies should be specific and identifiable; no generalized or vague statements are acceptable.

4.3 TEMPORARY SHORING AND RETAINING WALLS

- Provide specific design recommendations for 1) active and passive earth pressures, 2) surcharge pressures, 3) bearing capacity, 4) minimum or maximum dimensions and depth of penetration, 5) lateral support, 6) wall or backfill drainage systems, and 7) any other appropriate structural details.
- If appropriate, provide specific design recommendations for tie-back anchors including 1) anchor inclination, 2) no load zones, 3) minimum anchor length, 4) anchor bond zone, 5) anchor adhesions, and 6) corrosion protection.
- Provide specific construction recommendations for 1) installation, 2) on-site and/or import backfill materials, 4) backfill material moisture conditioning, placement, and compaction, 5) in-place density testing or other quality control measures, and 6) seepage and drainage control.
- If appropriate, provide construction recommendations for tie-back anchors including 1) anchor installation methods, 2) anchor testing, and 3) monitoring.

4.4 ROCKERIES

- Provide recommendations as outlined in the Associated Rockery Contractors (ARC) Standard Rock Wall Construction Guidelines (December 1992).
- The geotechnical engineer should provide direct input to the design of the rockeries and provide construction monitoring and testing as appropriate. Specific design parameters may include: Rock quality, density, frequency of testing, slopes, keyways, surcharges, drainage, rock sizes, face inclination, and surface drainage.

4.5 REINFORCED SOIL STRUCTURES

- Geogrid or geotextile fabric may be used to reinforce a fill. Reinforcement results in a more stable slope and helps reduce the risk of significant long term maintenance. If reinforced slopes are used, the geotechnical engineer should specify, at a minimum, the fill soil materials, vertical spacing of the reinforcement, the specific type of reinforcement and the distance to which it must extend into the fill, the amount of overlap at reinforcement joints, and the construction sequence. Additional design parameters will be required for each specific site.

4.6 STRUCTURE AND FOUNDATIONS

- Provide seismic design recommendations for 1) Building Code soil type and Site Coefficient, and 2) any specific recommendations to reduce the risk of damage due to earthquakes.
- Spread footing foundations - provide design recommendations for 1) bearing soils, 2) bearing capacity,
3) minimum footing depths and widths for both interior and exterior footings, 4) lateral load resistance, and 5) foundation drainage system.
- Mat foundations - provide design recommendations for 1) bearing soils, 2) bearing capacity, 3) modulus of subgrade reaction, 4) minimum dimensions, and 5) lateral load resistance.
- Pile foundations - provide design recommendations for 1) type of pile, 2) means of support (end or friction), 3) minimum dimensions and depths, 4) allowable vertical and uplift capacity, 5) allowable lateral loads and deflections, and 6) group effects and minimum spacing.
- Spread footing or mat foundations - provide construction recommendations for 1) foundation subgrade preparation and protection, 2) verification of bearing capacity, and 3) installation of foundation drainage system.
- Pile foundations - provide construction recommendations for 1) pile driving equipment, 2) pile installation, 3) pile load tests or verification piles, and 4) monitoring and testing during pile installation.

4.7 FLOORS

- Slab-on-Grade Floors - provide design recommendations for 1) slab base rock thickness, 2) capillary break, 3) vapor barrier, and 4) floor system drainage.
- Supported Wood Floors - provide design recommendations for 1) vapor barrier, and 2) crawl space drainage.
- Slab-on-Grade Floors - provide construction recommendations for 1) subgrade preparation, 2) slab base rock placement and compaction, 3) capillary break and vapor barrier installation, and 4) floor drainage system installation (if appropriate).

4.8 PAVEMENTS

- Provide design recommendations for 1) pavement design section, and 2) pavement drainage (see the requirements of the Bellevue Transportation Department Design Manual, http://www.bellevuewa.gov/pdf/Transportation/Transportation_Design_Manual.pdf).
- Provide construction recommendations for 1) pavement subgrade preparation and verification, and 2) pavement base and subbase materials, placement, and compaction.

4.9 UTILITIES

- Provide construction recommendations for 1) utility excavation, 2) bedding material placement, and 3) backfill material, placement, and compaction.
- Provide construction recommendations for subgrade preparation, monitoring and inspection during infiltration facility (including bioretention and pervious pavement) installation, where applicable.
- Provide information as required in Section D2-06.5 of the [City of Bellevue Utilities Storm and Surface Water Engineering Standards](#)

4.10 DRAINAGE

- Recommend provisions for subsurface drainage at walls, floors, and footings (see section CG7-12 of the Bellevue Clearing & Grading Development Standards for wall drain requirements).
- Evaluate permanent and temporary surface and subsurface drainage for both walls and floors if applicable. Provide approximate flow rates in gallons per minute and pipe sizes if required by design.
- Recommend locations suitable for infiltration facilities, if any.

4.11 HAZARDS

- Present additional information if natural or man-made hazards exist on the property. King County Map Folio of Sensitive Areas delineate hazards in the categories of wetlands, streams and flood hazard, erosion, landslide, seismic, and coal mine hazards. Recommendations should be general and further studies may be required.

REPORT FIGURES AND ILLUSTRATIONS

1. VICINITY MAP

Include a Vicinity or Location Map which presents adequate street and/or other physical references to allow clear identification of the project location. This map may be an individual figure or be included on the Site Plan.

2. SITE PLAN

Show the project boundaries, property lines, existing features and the proposed development and structures.

A north arrow and scale should be included along with all subsurface exploration locations. The accuracy of exploration locations should be indicated on the Site Plan or in the report.

3. EXPLORATION LOGS

Include logs of all explorations describing soil units encountered, soil classification, density or stiffness, moisture conditions, groundwater levels, stratigraphic sequence, common geologic unit name, and other descriptive information.

4. LABORATORY TEST DATA

Include figures or tables of laboratory test results if presentation of all the data, in the text, would require more than a simple paragraph to supplement the data provided in the exploration logs.

5. CROSS SECTIONS

Include cross sections to visually present all but the simplest subsurface conditions.

6. TYPICAL DETAILS

Include figures, graphs, and other visual aids to clearly present detailed recommendations. Provide design details (stamped by a professional engineer) on drawings such as: rockeries, reinforced earth, interceptor trenches, wall and footing drains, utility backfill, and other details used for a particular design.

STANDARDS FOR SLOPE STABILITY

ANALYSES STUDY REQUIREMENTS

The geotechnical engineer should review and evaluate the stability of natural, temporary, and permanently constructed slopes on or adjacent to the property to be developed. Such review should, at a minimum, include:

- Review of published geologic data referencing or including the site.
- Review of previous studies of the site performed by geotechnical engineers.
- Reconnaissance of the site for signs of slope instability.

Where such review, in the opinion of the engineer or the City, indicates that the stability of the slopes are reduced by the proposed development, or that the natural slopes may have a factor of safety of less than 2.0 in the static case or 1.5 in a dynamic (seismic) case, then the geotechnical engineer shall perform additional, more detailed review and evaluation of the stability of the slope. Such additional review and evaluation should, at a minimum, include:

- Drilling and sampling of test borings to a depth necessary for the evaluation of slip surfaces with factors of safety lower than the above criteria, or to at least 15 feet or 10 percent of the slope height (whichever is less) beyond the most critical slip surface for the design.

- Laboratory shear testing of soil samples which are representative of all significant zones or layers of soil and/or rock through which the potential slip surfaces pass.
- Performing a limit equilibrium analyses or other approved analyses of all significant critical slip surfaces associated with the slope. Approved analyses may be conducted by a computer program if the methodology and assumptions are clearly delineated and the name, version number, and solution methodology of the program are clearly presented in the report. For pseudo-static seismic analyses, the acceleration factor must be based on a peak ground acceleration with a maximum of a 10 percent of probability of exceedance in 50 years (i.e. a 475-year return period). A higher peak ground acceleration should be used (e.g. one with a 2 percent probability of exceedance in 50 years), if the engineer and the applicant consider it appropriate for the project. Alternatively, a site specific seismic study can be conducted to determine an appropriate maximum horizontal acceleration. The geotechnical report must include cross sections of the slope(s) and critical slip surfaces produced as part of the slope stability analyses.
- Other analyses as required by the City.

DESIGN REQUIREMENTS

For a limit equilibrium analyses, design factors of safety for slopes shall be no less than the following:

	Temporary Slope	Permanent Slope	
		Low Threat	High Threat
		<u>Upon Failure¹</u>	<u>Upon Failure²</u>
Static	1.25	1.40	1.50
Dynamic	1.05	1.10	1.15

The analysis should consider the impact of groundwater in the modeling of soil strength and density parameters, and in other ways considered appropriate by the engineer. A conservative wet season analysis should be used for permanent slopes and those temporary slopes which will be constructed at any time between, and including, the months of October 1 and May 31.

Alternative analyses may be proposed by the geotechnical engineer and accepted by the City, if they are based upon accepted and published methodologies which evaluate static and dynamic loading cases, as well as the consequences of the type of slope failure under consideration. Other design requirements remain the same.

1. Permanent slopes termed "Low Threat Upon Failure" are those slopes whose failure will not impact buildings or other structures inhabited by humans.

2. Permanent slopes termed "High Threat Upon Failure" are those slopes whose failure will impact or have a reasonable engineering probability of impacting building or other structures inhabited by humans.



Standard Notes for Erosion Control Plans

1. All clearing & grading construction must be in accordance with City of Bellevue (COB) Clearing & Grading Code, Clearing & Grading Development Standards, Land Use Code, Uniform Building Code, permit conditions, and all other applicable codes, ordinances, and standards. The design elements within these plans have been reviewed according to these requirements. Any variance from adopted erosion control standards is not allowed unless specifically approved by the City of Bellevue Development Services (DSD) prior to construction.

It shall be the sole responsibility of the applicant and the professional civil engineer to correct any error, omission, or variation from the above requirements found in these plans. All corrections shall be at no additional cost or liability to the COB.

2. Approval of this erosion/sedimentation control (ESC) plan does not constitute an approval of permanent road or drainage design (e.g. size and location of roads, pipes, restrictors, channels, retention facilities, utilities, etc.).
3. A copy of the approved plans and drawings must be on-site during construction. The applicant is responsible for obtaining any other required or related permits prior to beginning construction.
4. The implementation of these ESC plans and the construction, maintenance, replacement, and upgrading of these ESC facilities is the responsibility of the applicant/contractor until all construction is completed and approved and vegetation/landscaping is established.
5. The ESC facilities shown on this plan must be constructed in conjunction with all clearing and grading activities, and in such a manner as to ensure that sediment and sediment laden water do not enter the drainage system, roadways, or violate applicable water standards.
6. The ESC facilities shown on this plan are the minimum requirements for anticipated site conditions. During the construction period, these ESC facilities shall be upgraded as needed for unexpected storm events and to ensure that sediment and sediment-laden water do not leave the site.
7. All locations of existing utilities have been established by field survey or obtained from available records and should, therefore, be considered only approximate and not necessarily complete. It is the sole responsibility of the contractor to independently verify the accuracy of all utility locations and to discover and avoid any other utilities not shown which may be affected by the implementation of this plan.
8. The boundaries of the clearing limits shown on this plan shall be clearly flagged in the field prior to construction. During the construction period, no disturbance beyond the flagged clearing limits shall be permitted. The flagging shall be maintained by the applicant/contractor for the duration of construction.
9. Clearing shall be limited to the areas within the approved disturbance limits. Exposed soils must be covered at the end of each working day when working from October 1st through April 30th. From

May 1st through September 30th, exposed soils must be covered at the end of each construction week and at the threat of rain.

10. At no time shall more than one foot of sediment be allowed to accumulate within a trapped catch basin. All catch basins and conveyance lines shall be cleaned prior to paving. The cleaning operation shall not flush sediment laden water into the downstream system.
11. Stabilized construction entrances shall be installed at the beginning of construction and maintained for the duration of the project.
12. The contractor must maintain a sweeper on site during earthwork and immediately remove soil that has been tracked onto paved areas as result of construction.
13. The ESC facilities shall be inspected daily by the applicant/contractor and maintained as necessary to ensure their continued functioning.
14. Any excavated material removed from the construction site and deposited on property within the City limits must be done in compliance with a valid clearing & grading permit. Locations for the mobilization area and stockpiled material must be approved by the Clearing and Grading Inspector at least 24 hours in advance of any stockpiling.
15. The ESC facilities on inactive sites shall be inspected and maintained a minimum of once a month or within the 48 hours following a major storm event.
16. Final site grading must direct drainage away from all building structures at a minimum 5% slope, per the International Residential Code (IRC) R401.3.



Background Information on Chemical Treatment

Coagulation and flocculation have been used for over a century to treat water. It is used less frequently for the treatment of wastewater. The use of coagulation and flocculation for treating stormwater is a very recent application. Experience with the treatment of water and wastewater has resulted in a basic understanding of the process, in particular factors that affect performance. This experience can provide insights as to how to most effectively design and operate similar systems in the treatment of stormwater.

Fine particles suspended in water give it a milky appearance, measured as turbidity. Their small size, often much less than 1 μm in diameter, give them a very large surface area relative to their volume. These fine particles typically carry a negative surface charge. Largely because of these two factors, small size and negative charge, these particles tend to stay in suspension for extended periods of time. Thus, removal is not practical by gravity settling. These are called stable suspensions. Polymers, as well as inorganic chemicals such as alum, speed the process of clarification. The added chemical destabilizes the suspension and causes the smaller particles to agglomerate. The process consists of three steps: coagulation, flocculation, and settling or clarification. Each step is explained below as well as the factors that affect the efficiency of the process.

Coagulation: Coagulation is the first step. It is the process by which negative charges on the fine particles that prevent their agglomeration are disrupted. Chemical addition is one method of destabilizing the suspension, and polymers are one class of chemicals that are generally effective. Chemicals that are used for this purpose are called coagulants. Coagulation is complete when the suspension is destabilized by the neutralization of the negative charges. Coagulants perform best when they are thoroughly and evenly dispersed under relatively intense mixing. This rapid mixing involves adding the coagulant in a manner that promotes rapid dispersion, followed by a short time for destabilization of the particle suspension. The particles are still very small and are not readily separated by clarification until flocculation occurs.

Flocculation: Flocculation is the process by which fine particles that have been destabilized bind together to form larger particles that settle rapidly. Flocculation begins naturally following coagulation, but is enhanced by gentle mixing of the destabilized suspension. Gentle mixing helps to bring particles in contact with one another such that they bind and continually grow to form "flocs." As the size of the flocs increases they become heavier and tend to settle more rapidly.

Clarification: The final step is the settling of the particles. Particle density, size and shape are important during settling. Dense, compact flocs settle more readily than less dense, fluffy flocs. Because of this, flocculation to form dense, compact flocs is particularly important during water treatment. Water temperature is important during settling. Both the density and viscosity of water are affected by temperature; these in turn affect settling. Cold temperatures increase viscosity and density, thus slowing down the rate at which the particles settle.

The conditions under which clarification is achieved can affect performance. Currents can affect settling. Currents can be produced by wind, by differences between the temperature of the incoming water and the

water in the clarifier, and by flow conditions near the inlets and outlets. Quiescent water such as that which occurs during batch clarification provides a good environment for effective performance as many of these factors become less important in comparison to typical sedimentation basins. One source of currents that is likely important in batch systems is movement of the water leaving the clarifier unit.

Given that flocs are relatively small and light the exit velocity of the water must be as low as possible. Sediment on the bottom of the basin can be resuspended and removed by fairly modest velocities.

Coagulants: Polymers are large organic molecules that are made up of subunits linked together in a chain-like structure. Attached to these chain-like structures are other groups that carry positive or negative charges, or have no charge. Polymers that carry groups with positive charges are called cationic, those with negative charges are called anionic, and those with no charge (neutral) are called nonionic.

Cationic polymers can be used as coagulants to destabilize negatively charged turbidity particles present in natural waters, wastewater and stormwater. Aluminum sulfate (alum) can also be used as this chemical becomes positively charged when dispersed in water. In practice, the only way to determine whether a polymer is effective for a specific application is to perform preliminary or on-site testing.

Polymers are available as powders, concentrated liquids, and emulsions (which appear as milky liquids). The latter are petroleum based, which are not allowed for construction stormwater treatment. Polymer effectiveness can degrade with time and from other influences. Thus, manufacturers' recommendations for storage should be followed. Manufacturer's recommendations usually do not provide assurance of water quality protection or safety to aquatic organisms. Consideration of water quality protection is necessary in the selection and use of all polymers.

Application Considerations: Application of coagulants at the appropriate concentration or dosage rate for optimum turbidity removal is important for management of chemical cost, for effective performance, and to avoid aquatic toxicity. The optimum dose in each application depends on several site-specific features. Turbidity of untreated water can be important with turbidities greater than 5,000 NTU. The surface charge of particles to be removed is also important. Environmental factors that can influence dosage rate are water temperature, pH, and the presence of constituents that consume or otherwise affect polymer effectiveness. Laboratory experiments indicate that mixing previously settled sediment (floc sludge) with the untreated stormwater significantly improves clarification, therefore reducing the effective dosage rate. Preparation of working solutions and thorough dispersal of polymers in water to be treated is also important to establish the appropriate dosage rate.

For a given water sample, there is generally an optimum dosage rate that yields the lowest residual turbidity after settling. When dosage rates below this optimum value (under dosing) are applied, there is an insufficient quantity of coagulant to react with, and therefore destabilize, all of the turbidity present. The result is residual turbidity (after flocculation and settling) that is higher than with the optimum dose. Overdosing, application of dosage rates greater than the optimum value, can also negatively impact performance. Again, the result is higher residual turbidity than that with the optimum dose.

Mixing in Coagulation/Flocculation: The G-value, or just "G", is often used as a measure of the mixing intensity applied during coagulation and flocculation. The symbol G stands for "velocity gradient", which is related in part to the degree of turbulence generated during mixing. High G-values mean high turbulence, and vice versa. High G-values provide the best conditions for coagulant addition. With high G's, turbulence is high and coagulants are rapidly dispersed to their appropriate concentrations for effective destabilization of particle suspensions.

Low G-values provide the best conditions for flocculation. Here, the goal is to promote formation of dense, compact flocs that will settle readily. Low G's provide low turbulence to promote particle

collisions so that flocs can form. Low G's generate sufficient turbulence such that collisions are effective in floc formation, but do not break up flocs that have already formed.

Design engineers wishing to review more detailed presentations on this subject are referred to the following textbooks.

- Fair, G., J. Geyer and D. Okun, Water and Wastewater Engineering, Wiley and Sons, NY, 1968.
- American Water Works Association, Water Quality and Treatment, McGraw-Hill, NY, 1990.
- Weber, W.J., Physiochemical Processes for Water Quality Control, Wiley and Sons, NY, 1972.

Adjustment of the pH and Alkalinity: The pH must be in the proper range for the polymers to be effective, which is 6.5 to 8.5 for Calgon CatFloc 2953, the most commonly used polymer. As polymers tend to lower the pH, it is important that the stormwater have sufficient buffering capacity. Buffering capacity is a function of alkalinity. Without sufficient alkalinity, the application of the polymer may lower the pH to below 6.5. A pH below 6.5 not only reduces the effectiveness of the polymer, it may create a toxic condition for aquatic organisms. Stormwater may not be discharged without readjustment of the pH to above 6.5. The target pH should be within 0.2 standard units of the receiving water pH

Experience gained at several projects in the City of Redmond has shown that the alkalinity needs to be at least 50 mg/L to prevent a drop-in pH to below 6.5 when the polymer is added.